SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2142.—VOL. XLVI LONDON, SATURDAY, SEPTEMBER 9, 1876. PRICE (WITH THE JOURNAL) SIXPENCE. PER ANNUM, BY POST, £1 4s.

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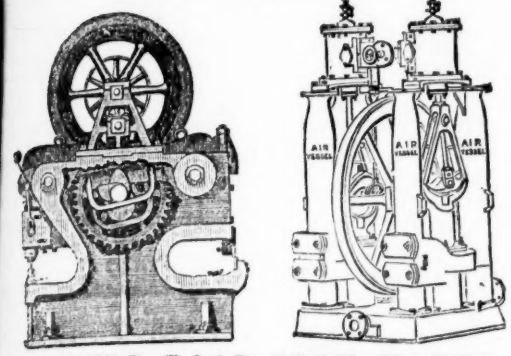

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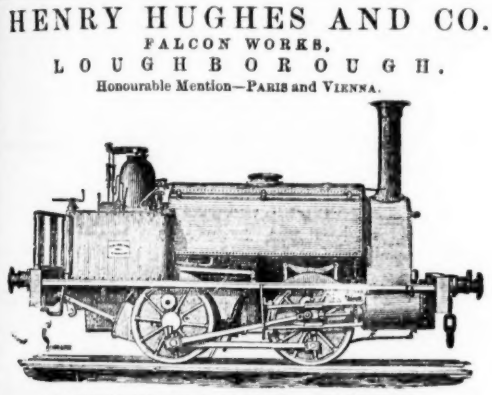

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PARIS, BRONZE MEDAL, 1867.

ORDER OF THE CROWN OF PRUSSIA.

FALMOUTH, SILVER MEDAL, 1867

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the Geographical Congress, Paris, 1875—M. Favre, Contractor, having exhibited the McKean Drill alone as the MODEL BORING MACHINE for the ST. GOTHARD TUNNEL.

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At the south end of the St. Gothard Tunnel, where

THE McKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecutive weeks, ending February 7, was 24·90, 27·60, 24·80, 26·10, 28·30, 27·10, 28·40, 28·70 metres. Total advance of south heading during January was **121·30 metres, or 133 yards.**

In a series of comparative trials made at the St. Gothard Tunnel, the McKean Rock Drill continued to work until the pressure was reduced to one-half atmosphere (7½ lbs.), showing almost the entire motive force to be available for the blow against the rock—a result of itself indicating many advantages.

The GREAT WESTERN RAILWAY has adopted these Machines for the SEVERN TUNNEL; the LONDON AND NORTH-WESTERN RAILWAY for the FESTINIOG TUNNEL: and the BRITISH GOVERNMENT for several Public Works. A considerable number of Mining Companies are now using them. Shafts and Galleries are driven at from three to six times the speed of hand labour, according to the size and number of machines employed, and with important saving in cost. The ratio of advantage over hand labour is greatest where the rock is hardest.

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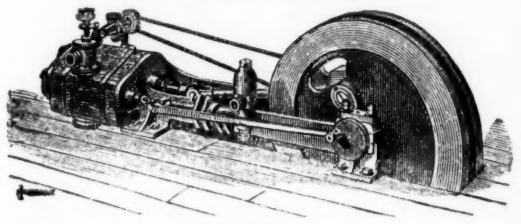

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2.—ONLY ABOUT ONE-FOURTH OF THE SPACE USUALLY OCCUPIED BY DRESSING-FLOORS IS REQUIRED.

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4.—THEY ARE THE ONLY MACHINES THAT MAKE THE ORE CLEAN FOR MARKET AT ONE OPERATION.

They have been supplied to some of the principal mines in the United Kingdom and abroad—viz.,

The Greenside Mines, Patterdale, Cumberland; London Lead Company's Mines Darlington, Colberry, Nanthead, and Bollyhope; the Stonecroft and Greyside Mines, Hexham, Northumberland; Wanlockhead Mines, Abington, Scotland (the Duke of Buccleuch's); Bewick Partners, Haydon Bridge; the Old Darren, Esgairmwyn, and Ystumtuen Mines, in Cardiganshire; Mr. Beaumont's W.B. Mines, Darlington; also Mr. Sewell, for Argentiferous Copper Mines, Peru; the Bratsberg Copper Mines, Norway and Mines in Italy, Germany, United States of America, and Australia, from all of whom certificates of the complete efficiency of the system can be had.

WASTE HEAPS, consisting of refuse chats and skimpings of a former washing, containing a mixture of lead, blende, and sulphur, DRESSED TO A PROFIT.

Mr. BAINBRIDGE, C.E., of the London Company's Mines, Middleton-in-Teesdale, by Darlington, writing on the 20th March, 1876, says—"The yearly profit on our Nanthead waste heaps amounted last year to £600, besides the machinery being occupied for some months in dressing ore-stuff from the mines. Of course, if it had been wholly engaged in dressing wastes our returns would have been greater; but it is giving us every satisfaction, and bringing the waste heaps into profitable use, which would otherwise remain dormant."

Mr. T. B. STEWART, Manager of the Duke of Buccleuch's Mines, Wanlockhead, Abington, N.B., writing on 20th March, 1876, says—"I have much pleasure in stating that a full and superior set of your Ore Dressing Machinery has been at work at these mines for fully a month, and each day as the moving parts become smoother, and those in charge understand the working of the machinery better, it gives increasing satisfaction, the ore being dressed more quickly, cheaply, and satisfactorily than by any other method."

Mr. BAINBRIDGE, speaking of machinery supplied Colberry Mines, says—"Your machinery saves fully one-half on old wages, and vastly more on the wages we have now to pay. Over and above the saving in cost is the saving in ore, which is not much short of 10 per cent."

GREENSIDE MINE COMPANY, Patterdale, near Penrith, say—"The separation which they make is complete."

Mr. MONTAGUE BEALE says—"It will separate ore, however close the mechanical mixture, in such a way as no other machines can do."

Mr. C. DODSWORTH says—"It is the very best for the purpose and will do for any kind of metallic ores—the very thing so long needed for dressing-floors."

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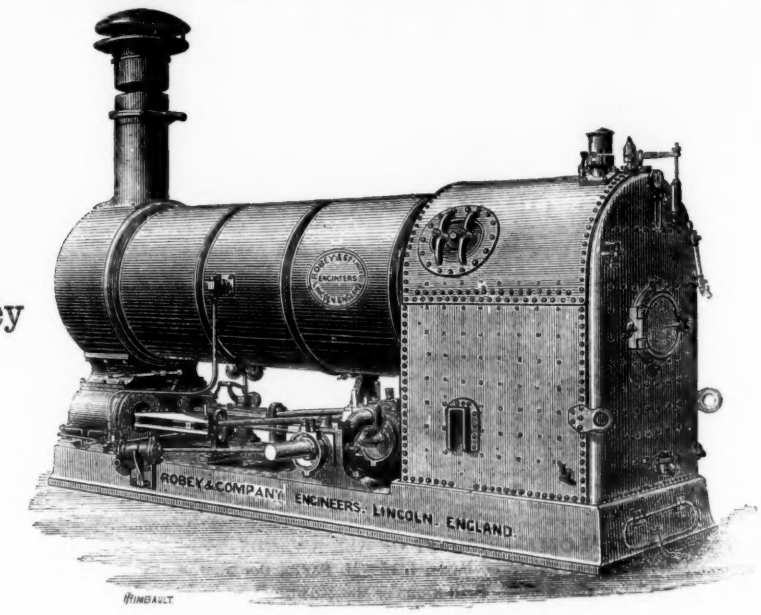
The Cost of all expensive Brick Buildings and Chimney is saved by this Engine.



The Boiler is specially arranged to burn saw-dust and refuse wood, and every description of inferior fuel, and thus economise Coal.

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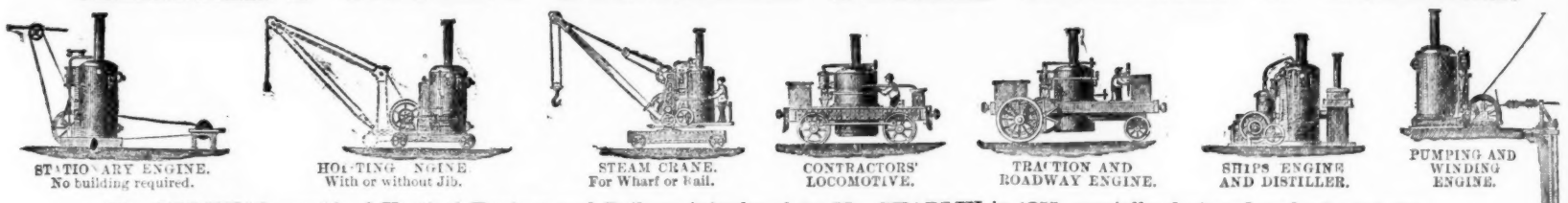
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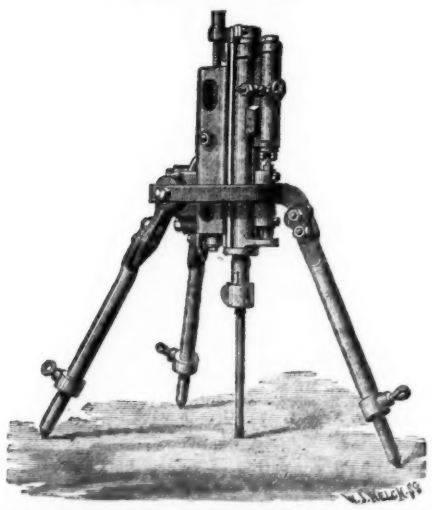

Intending purchasers can satisfy themselves that the advantages claimed for the "CHAMPION" over all other Rock Borers are not over-estimated.

For the amount of work it will do, it is the lightest, most compact, most durable, and cheapest in the market.

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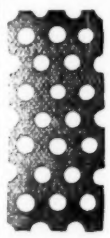

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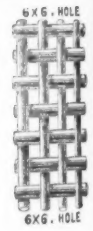

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BOILERS; AIR COMPRESSORS, worked by Hydraulic or Steam-power; STEEL for MINING DRILLS; PUMPING, and all other MINING MACHINERY supplied.

For Prices, Estimates, and other Particulars, apply to—

J. G. CRANSTON, 22, GREY STREET,

NEWCASTLE-ON-TYNE.

Mr. TAIT, Manager, East Hetton Quarry Company's Works, Coxhoe, Durham, writing on May 12, 1876, says—"I have pleasure in testifying to the value of your Rock Drills. The two you supplied us with about six months ago are giving us entire satisfaction. The cost of drilling by machine is less THAN ONE-FOURTH THAT OF DRILLING BY HAND. By the use of the Drills we have been able very greatly to increase the out-put of stone without increasing the number of men employed."

Teams Patent Hemp and Wire Rope Works,

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MANUFACTURERS of every description of ROUND and FLAT ROPES of any length for COLLIERY, RAILWAY, AGRICULTURAL, SHIPPING, and other purposes, and guaranteed of the highest standard of strength.

Best Selected Charcoal Iron, best Crucible Cast Steel, and extra strong Improved Steel Round and Flat Wire Ropes; Compound-laid non-rotating Flexible Ropes, in Iron or Steel for small gear and sinking purposes; Best Selected Charcoal Iron Guide Ropes; Galvanised and Plain Ropes for capstans, crabs, suspension bridges, canal towing, &c.; Patent Steel Plough Ropes; Galvanised Signal and Fencing Strands; Copper Rope Lightning Conductors; Steel, Iron, and Copper Sash Cords; Picture Cords; Russian, Italian, and Manilla Hemp Round and Flat Ropes; White and Tarred Hemp and Flax Spun Yarns; Round and Flat Rope Pulleys and Patent Springs for same; Galvanised Wire Rope for Ships' Standing Rigging; Russian, Italian, Manilla, and Coir Cordage; Towlines, Warps, Service and other Lines for Shipping Purposes; Ships' Rigging fitted by experienced workmen.

D., C., and S. beg to call special attention to the advantages to be derived by adopting their EXTRA STRONG IMPROVED STEEL ROPES, for lifting heavy loads in deep mines, also in hauling from long distances; a considerable reduction is effected in weight, friction materially reduced, and an extra amount of work got out of the rope—a rope 8 lbs. per fathom being equal in strength to an iron rope 20 lbs. per fathom, or an ordinary steel rope 13 lbs. per fathom.

Original Correspondence.

THUNDERER EXPLOSION.

To the Lords Commissioners of the Admiralty.

MY LORDS AND GENTLEMEN,—Reverting to my former communications to you relative to the cause of the explosion on board the Thunderer, I cannot avoid expressing my gratification at the result of the Coroner's inquest in the particulars that "the accident is due to the contraction of the metal seats of the valves," and that "the boilers of the Thunderer were of excellent materials and workmanship." But, I consider it to be important that in respect to these two items of the verdict I should proceed to offer your lordships a few brief observations—1. I must object that the assumption of the "contraction" of the metal seats is not a full or scientific judgment on, or explanation of, the cause of the accident, unless it be accompanied by the recognition of the previous and governing cause and effect upon the boiler, because there was no contraction of metal, but, contrariwise, an expansion of metal throughout; and the contraction of the aperture which constituted the metallic seat was due only and simply to the general expansion of the whole bulk of the iron of the boiler, by which (to repeat the operation) the orifice which was made for the seat and its collar was squeezed into contraction; the true effect being, that excessive heat caused the iron to expand, mainly on all the external edges of the boiler, without apparent mischief beyond enlarging its bulk, and then further to expand the inner edges of the orifice, which was made for the seat of the valve, with the inevitable mischief of closing very minutely the aperture for the seat inwardly upon the safety-valve, the edges of which would, at the same time, and by the same influence, expand to meet the contraction of the seat, and thus become jammed or immovable. This, although not expressed in the verdict, should become known and recognised in practice.—2. That "the boilers of the Thunderer were of excellent materials." This second conclusion, conjoined with the former, brings me back to the gist of the matters which I have been endeavouring to force on your lordships' attention. Undoubtedly we must receive the verdict of the jury as generally correct, but such a verdict fully proves my former assertions—that the best irons which we now produce are not cleansed from the impurities of the iron ores now used, nor from the impurities of the ingredients now added in smelting.

As I have stated in my letters, the accident is clearly assumed and stated to be due to the expansion of the iron under heat (erroneously called "contraction," if applied to the metal), and I have already stated that such expansion is only due to the swelling of the sulphur yet resident in the manufactured iron, such causing the disintegration of its fibre, but there would not be any disintegration of the fibre of pure, or non-sulphuric, iron.

I have said before that the ironmasters generally do not believe in the existence of a pure iron ore to begin with, therefore the verdict is correct that, so far as irons are now assumed to be produced, "the materials were excellent"—that is, the contractors made use of the best material now provided; but, as I have also said before, that is a scientific error, and pure ores can be obtained to commence with, and pure iron can be produced as the result. I assume, therefore, the verdict cannot be complained of, and no persons can be justly blamed, but it is our duty to remedy the evil in the manufacture of our iron, which is thereby declared to be defective, if such remedy can be obtained by seeking pure ores, and by the Government encouraging the pure manufacture thereof.

I am fearful lest it may be assumed that (the Thunderer enquiry being disposed of, rightfully, with no person to blame) we may lapse into lethargy, and allow the matter to rest; but the object of my taking the liberty to write to your lordships is to say that the accident of the Thunderer has only opened our eyes to much further disaster of the same character, which may, and will, overtake us unless the subject be carried on from this starting point of knowledge to a practical revision of our ironsmelting operations, such as I have named; and with that effected, I think I may say our armour plating for ships of war may be reduced one-third or one-half in thickness, with the same amount of resisting power, our boilers and their mechanical attachments may be rendered trustworthy and secured in a far greater degree from explosion or fracture, and our heavy artillery may be made to discharge the same projectiles with one-half the present weight of iron; all such matters being dependent on pure iron effecting enormous saving, not only in plating or guns, but in all the accompaniments of stability, whether iron or wood; and further than this, the improvement in our iron might restore to us our lost prestige as contractors for especial purposes for the world's requirements. FREDK. SAMSON THOMAS.

16, *Richmond-crescent, Barnsbury, Sept.* 3.

THE NASCENT COPPER COMPANY (LIMITED).

SIR,—For the information of the numerous enquirers I would ask your permission to make a few observations on the objects for which this company is established; in the first place the present operations are confined to the extraction of metals from their ores by the now well known and universally acknowledged successful method—the Nascent Process; this it is intended to continue and to increase the business from time to time as success warrants; to enable a company to proceed in such a manner works must necessarily be erected to include furnaces and tanks for the complete treatment of ores; instead of being subjected to, in our case, an unnecessary expense in raising factories we have had offered and accepted conditionally most extensive works, situated very conveniently close to a navigable river, and furnished with furnaces, flues, and a most excellent chimney (the best in the county), rising to an altitude of nearly 300 ft. from the roadway, together with a quay, at which vessels of considerable burthen can load and discharge. Although some of the furnaces require alteration and others renewal, there are a number in exceedingly good condition; in fact, so much so that the continued burning of ore goes on at the present time without cessation (except in the extreme cases referred to later on) both by day as well as by night, besides this there are tanks (also kept going), and the remaining requisites to prove to the satisfaction of all the value of the process. The good fortune that hitherto attended the manipulation of ores by the wet method is such as to guarantee handsome returns and consequent profits, provided that the supplies are well looked after—for instance, the furnaces at work are capable of receiving 10 tons of ore per diem; this small quantity leaves a goodly margin for profit, but the capital on which the present proprietors depend being small, they are prevented from acquiring those large quantities of mineral required in works of this description, the result being that stoppages have occurred rather too frequently to be pleasant. We, therefore, ask for cash, firstly to gain possession of the Nascent Copper Works, then to provide a sufficiency of furnaces and tanks to enable us to do at least 50 tons per day (which will necessitate the employment of very few hands more), there being practically no limit to the quantity that can be treated if due increase of plant and machinery is made, to purchase ores (in such quantities that no possibility can exist of a scarcity at any time with its accompanying stoppages) either in an unbroken or a crushed state, as circumstances permit or require, to erect crushing machinery, to restore furnaces and multiply the number of tanks to meet the increased demand. We shall then be placed in such a position that handsome returns and dividends are, to a certain extent, certain, from the fact that the speculations of mining do not interfere with us, our business (similar to that of smelting) being confined to the purchase and treatment of ores. I requested the manager (as a private matter altogether) to embrace all his experiences in a report; he did so, and (with his permission) consider this a favourable moment for publication, the following, therefore, is a copy:—

SIR,—In reply to your request for a minute statement of my experience in the working of the Nascent Copper Process, and the probability of profitable returns therefrom, I have great pleasure in adding my testimony to the value of the process. I am quite certain, from past experience, that if ores of low percentage for copper are obtained—that is, for their full value in the public market—and a moderate quantity per day is treated—5 or 10 tons to start with, and with the advantage we have now attained of the reduced quantity of fuel required, that large and handsome dividends can be realised, and as the quantities treated are increased profits will as a matter of course increase also. For the last three years, or I might say from the very first public treatment of metallic ores by the Nascent Copper Process, I have been appointed to superintend the manipulation, to keep and render all accounts of ores received and treated, their value, &c., to supply all materials to the men, to assay the ores in and out of the furnace, and also the residue from tanks after treatment (which assay is highly necessary as a guide to the proper and effectual treatment of the different classes of ore), and generally to overlook the whole process. One may fairly calculate on having not less than 1¼ per cent. of copper, and from 2½ to 3 ozs. of silver per ton, which has been about the average quality of stuff I have been treating for the last three years and upwards.

I have no hesitation in saying that if ores of 1 per cent. copper, and 2½ ozs. of silver be procured at a moderate first charge, and not less than 3 tons per day be treated, good returns would be made, and consequent profits would accrue; and, of course, the larger the quantity of stuff treated in a day so much greater would be the returns and profits. I can, therefore, heartily and sincerely recommend the adoption of the Nascent Copper Process for the extraction of metals from these ores, being thoroughly convinced of the success and value of the same, putting aside all thought and question of bye-products, in the shape of arsenic, soda, bleaching powder, &c. I have found in my experience that a profit of from 30 to 33 per cent. can be made on ores giving 1¼ per cent. of copper and 2½ to 3 ozs. of silver per ton. I should strongly recommend the erection of a good crusher at once; I find there is an engine on the works which can be altered and made available for driving the crusher, which should also be at once put in working order. Stamping not being suitable for copper ores, as they are partially soluble in water, and, therefore, in stamping would to a certain extent be washed out; this a crusher would prevent, as no water would then come in contact with the crushed ore. Again, the crusher should be at once erected to get underhand a sufficient quantity of crushed ore, so as to keep the furnaces going for (say) two or three weeks, as all machinery is subject to breakages, and the consequent delay in repairs to same; if, therefore, you have a stock of crushed ore to fall back upon, furnacemen and other departments can be kept going, otherwise all would be idle, and cost going on just the same as if all were in full work. I have seen these things occur so many times as to cause the delay of several days, which would be wise to provide for or guard against, so that all might not be thrown idle. I find there is a 10 ton boiler on the works which is sufficiently large to supply steam, both for crushing and stamping if required, and an engine, as before stated, of ample power for the work; also water for stamping and dressing purposes. There is also a good quay, at which vessels of considerable tonnage may load and discharge at a comparatively small cost. A tramroad could also be extended from the vessel side into the works; this would be a great saving of cost, as the engine before alluded to would haul up the wagons from the quay to the furnaces.

In the works you are supplied with facilities for the treatment of large quantities of ore which would prove immensely expensive to erect. In the first place, we have a perfect labyrinth of flues, extending from all parts of the works, and coming to a point near the base of one of the finest stacks in the county; there are also the remains of several furnaces still standing, but which require alteration to be made available for the chloridisation of ores. You will require these alterations to be made as soon as possible, to be enabled to carry on anything like extensive works. An increase of the number of tanks is also requisite, the four at present at work being easily kept going in consequence of the insufficiency of ore.

In conclusion, taking all matters into consideration, the position of the works, their close proximity to the navigable River Tamar, the cheap water transport of ores, materials, stores, and the great facilities afforded of treating a large quantity of stuff, I have no hesitation in recommending the same as a thoroughly legitimate undertaking, and one that only requires proper management to make it highly remunerative. This end can without doubt be attained at a comparatively small outlay, as the business can be gradually, but certainly, increased from profits.

Harrowbarrow, St. Mellion, Cornwall, April 10. W. KNOTT.

It is quite unnecessary for me to enter further into the matter beyond reiterating my assertion that with the alterations and improvements made, as before mentioned, there is no doubt whatever of this company proving highly remunerative, and that before many months working the successes will show themselves. Prospectuses can be procured upon application at the address, and I shall be most happy to afford further information on the whole subject to any intending investor. THOMAS H. MILLER, secretary.

Bishopsgate-street Within, Sept. 8.

TIN IN AUSTRALIA.

SIR,—Some few months ago you were good enough to insert extracts from a letter received by myself from a practical authority on the tin supply in New England or Sydney district. I have within the last few days received another letter, and if you consider the following extracts sufficiently interesting for your paper you will, perhaps, be good enough to insert them:—

"In regard to the tin mines in this part of the country they are beginning to look very dull, as predicted in one of my former letters. Cope's Creek would be worked out in less than two years; this will be verified from the fact that in six or eight months there will not be a payable claim in all the Creek: indeed, if an Australian flood should come, as they do sometimes, all the workings would be swamped out, and never pay to open again unless tin is a great deal higher than it is now. There are eight or ten claims working, of which two or three are paying a small profit, and the remainder losing considerably. Some idea may be formed of the richness of the Creek when I say that 2000 tons of tin were taken out of an area not more than ½ mile long. Middle Creek, from which a great deal of tin has been taken, is run out, not a man working in it now. Vegetable Creek is also looking very dull, and the returns have fallen off greatly; there are not so many men employed in this creek by 200 as when I wrote you last. Many of the claims are not paying expenses, and only a few making a profit. A claim which is the richest, and has returned for the last 12 months 50 tons a week, the ground is nearly run out. Another claim, from which 1100 tons were taken from an area not exceeding 4 acres, is like the rest nearly worked out; while the blocks adjoining these rich claims are doing very little. As the surface deposits in the Creek are getting exhausted, attention is now being directed to the background, and here I think it necessary to explain how the tin is deposited therein. The tin can only be reached by what is called here deep sinking, varying from 10 to 50 ft through a kind of pipe-clay. In most cases when nearing the wash-dirt stones of quartz and basalt are met with, occasionally the latter forming a crust over the dirt. The dirt varies in thickness from a few inches to 4 feet, composed of loose stones of quartz, shewing occasionally good spots of tin, all very much water-worn; tin and pipe-clay are more or less cemented, and require puddling, but being free from any foreign matter are easy to clean. There is a large area of this kind of ground between Cope's and Middle Creeks, as well as on the high ground that cannot be made available for want of water, and, moreover, no chance of getting any, and the stuff is not rich enough to carry to water at present prices, but if it was 20*l.* a ton higher, and carriage and labour could be reduced to one-half what it is now, no doubt much of this ground could be made to pay a fair profit. There is much of this wash-dirt near the Vegetable Creek, but is found at a greater depth—from 80 to 90 ft.; and without a great change, in two years there will be but little doing. Very little is being done upon the lodes except about Cope's Creek; the veins are small, sometimes very good, but the ground by the sides is too hard to pay."

The foregoing remarks show that although a great deal of the rich ground is nearly exhausted, yet there remains a large area which—with tin 20*l.* a ton higher, and wages, &c., reduced 50 per cent.—could be made to pay a fair profit. As the item of wages is not likely to be reduced for many long years, it is evident that even with the rise in tin referred to this ground cannot leave a profit, hence the belief that very little of it will be worked. Assuming this to be the case, there is still hope for the Cornish mines, and to whom an advance of 20*l.* a ton would be salvation. A MINER.

MINING IN THE EAST—No. VIII.

ORAVITZA GOLD MINES.

SIR,—Amongst the many mining properties acquired during the last few years in Hungary and Servia by English adventurers the locally famed mines of Elisabetha and Golgotha—now consolidated and known as the Oravitza Gold Mines—have been the most successful, and promise to take a prominent position amongst the dividend paying mines during 1877. These mines are situated in and near the old mining town of Oravitza, the governmental centre of mining in the Banat of Hungary for hundreds of years. In the latter part of 1874 both mines were purchased by Messrs. George Heath and Brenton Symons, C.E., from an old gentleman who had successfully worked them for many years, but had latterly, through want of attention, permitted the levels and shafts to get into an unsafe condition; consequently, during a heavy rainy season, the workings suddenly ran together, and the mine was destroyed. Through this unexpected accident the present owners were enabled to secure the properties at a reasonable rate, and have since been actively engaged in resuscitating the mines.

After a considerable expenditure of time and capital the mines have been thoroughly re-opened, and the rich veins of gold ores left standing on the occasion of the sudden collapse of the mines have been reached and found equal to their reputed value. The new levels have also opened up large bodies of rich quartzose ores in rocks not previously suspected of containing gold. The rich leads have been opened to such an extent that profitable returns are certain, for some months to come, from these alone, whilst large masses of associated gangue, averaging 13 dwts. of gold per ton, have been laid open for stoping. The prospect of an extensive and lasting deposit is, therefore, so encouraging that it has been decided to erect either pneumatic or "elephant" stamps to maintain a reduction of 50 tons per diem, also to completely remodel the dressing floors, which are at present inconveniently crammed, for reduction on a large scale. It is thus hoped to obtain from the ores a higher percentage of gold than has been possible by the somewhat defective appliances hitherto in use.

The working of these mines is rendered facile by several advantages not usually possessed by foreign companies. The most important is an unlimited supply of skilled and cheap labour—miners only earning 1s. 6d. per diem, and labourers about 1s. 2d. This redundancy of labour has been occasioned by the decision of the States Railway Company, in 1864, to stop the copper mines surrounding Oravitza and Esiklowa, the latter another mining town about a mile distant. This step threw hundreds of men out of employment, who found themselves compelled to seek engagements elsewhere; but as they had during the long-continued prosperity of the mines acquired houses and vineyards, they are naturally most unwilling to remove, and prefer accepting a low wage at home to earning higher wages elsewhere. Another valuable feature was finding reduction works built and in going order, with the necessary steam and water power for driving stamps and machinery, and also a horse tramway from these works to the interior of the mines, through a stone arched gallery driven a mile into the mountain, and giving backs of at least 150 fms., so that for many years it will be unnecessary to erect pumping machinery. Not the least advantage is to be found in the society of Oravitza, which is made most charming by the number of Government and States Railway staff officers it includes, whose fixed idea is to make life as enjoyable as possible. The town being situated amongst the foothills of a wooded range of elevated limestone escarpments is surrounded by pleasing and picturesque scenery.

The geological features of the formations in which the mines are enclosed are most peculiar and interesting to the miner, but as they would demand much space a future occasion must be taken to describe them; for the present, it is sufficient to remark that the ores are found in a contact vein, which contains varied and valuable minerals, some of them very rare. The footwall is a fine granulite, whilst the hanging wall is of black and much shattered limestone. The metals and minerals which up to the present have been made commercially valuable are—gold, containing 1-24th of silver, worth 63*l.* per pound; bismuth, holding a large percentage of gold, sold for 13s. per pound; auriferous mundic, sold at Freiberg for 7*l.* per ton net, and also a small quantity of alloclase, containing 8-10ths per cent. of gold, worth 1200*l.* per ton. Numerous other minerals, such as cobalt, nickel, arsenic, copper, and lead, are found, but not in sufficient quantities to be of value. The gangue is a somewhat friable quartz, of a greenish gray and sometimes white colour, and the gold—seldom fine—is sprinkled through in threads and grains. The quartz is occasionally found of extraordinary richness, and as much as 5 lbs. weight of gold has been obtained from one "pitch" in a single "core."

The following table shows the result of the working for the two months of June and July. It should be observed that the heavy percentage of salaries and royalty will disappear when working on a larger scale is resumed:—

CR.				DR.			
Gold sales	£708	2	6	Mine cost	£185	14	4
Bismuth	10	10	0	Reduction works	37	7	6
Pyrites	20	0	0	Salaries and royalty	99	15	4
				Balance—profit	415	15	4
Total	£738	12	6	Total	£738	12	6

The dawning success of these mines has created quite an excitement in the neighbourhood, and many setts have been denounced which hitherto have lain quite neglected. There cannot be the slightest doubt about the value of the gold regions in Transylvania, and in the present state of stagnation in business many valuable properties might be cheaply obtained. The dearth of money in Hungary is really deplorable, and foreigners bringing capital into the country to employ it in mining would be received with the utmost cordiality. EMPRESSARIO.

RICHMOND CONSOLIDATED MINES.

SIR,—At one of the meetings of Richmond shareholders a stock jobber who was "bearing" Richmond shares largely, and was subsequently left stranded as a seller of more than 2000 which he could not deliver, said, upon its being questioned whether such transactions were morally legitimate, that "he came into the City to make money." This is upon the old principle, "make money—honestly if you can—but, make money." Your correspondent, "Investor," may or may not belong to the stock-jobbing clique of Richmond "bears," but he professes to know, and if he does so, why does he ignore the facts that the payment of dividends out of advances made by the bullion agent against ore raised, but not realised, was done with the knowledge and approval of the shareholders, and might have continued till now to the satisfaction of everyone but for the collapse at San Francisco about a year ago? That collapse demonstrated the danger of such a system, and necessitated its abandonment; but what has been done since? No dividends were paid for 12 months, at the commencement of which period it was stated that more than 100,000*l.* was owing to the bullion agent, the whole of which it is now stated has been paid off with the aid of 38,000*l.* raised on debentures.

Whence came the difference of 62,000*l.* if not from profits? When a man makes a half statement knowing the facts he does what is equivalent to making a false statement, for it can only be done for the purpose of misleading others. "Investor" says in his letter in in your last week's number "Captain Rickard says in his last report, 'the ore was mostly Richmond ore.' Where did the rest come from? What did it cost? What was the net profit or loss on the purchase? Did it contain any silver or precious metal?" Now, these are all important queries, but would it be believed by anyone who thought "Investor's" statements worth a grain of salt that Captain Rickard says in the same report "we only paid $5776 for outside ore for July month," and that the returns for July month were no less than $291,000. "Investor" had the "bane and antidote" both before him—he chose to give the bane only; can he be of the same clique as our honest "bear?"

As the company is said to be out of debt it is not evident that "more dividends have been paid than ought to have been paid," but it is quite evident that a mine which has been able in so short a period to return to its shareholders in dividends 3*l.* 1s. 6d. out of each 5*l.* of capital must be a rich mine, and, therefore, attractive to all our stock-jobbing friends who "come into the City to make money" by depreciating and traducing their neighbours' property.

Sept. 5. ANOTHER SHAREHOLDER.

CHONTALES MINING COMPANY.

SIR.—The labour question as regards the mines is a very important one. I ask—Have we a sufficient staff? If we look upon the duties the manager has undertaken, involving as they do a very great responsibility as reduction officer. The mills at San Domingo and Estrella, situated one mile apart, have to be supplied day and night with ore. When the ore is of a rich quality the amalgam becomes absorbed with the auriferous metal, and necessitates its removal, so that the gold shall not pass over the plates without having been brought in contact with the amalgam, requiring the constant attention of some responsible person. As an assayer Mr. Danby has the reputation of being well qualified; he would have to spend some time in the laboratory for that purpose, and as the natives will pilfer when they can if their assistance is required necessitates vigilance, and when the manager is absent some responsible person to look after the interests of the company. We are waiting for an explanation for the quantity of copper, as by the assay of gold from the mines, made in London. The duties of engineer are also very important, and we are informed that Mr. Danby has undertaken them. Our experience in machinery—Belt *v.* Smeddle—is very obvious; The former had a sufficient staff, and as regards machinery, it was erected with promptitude. On the other hand, the latter discharged his engineer, &c., evidently worked the machinery without repairing, and gave no additional results from the increased machinery at his command, leaving the stamps in that state, requiring, as it has, six months for repairs, and the shareholders have not been informed when they may expect their completion. Both of the mining captains have been discharged, and we have not heard of their being replaced. If a duty of such importance rests with the manager of the mines, as well as the other engagements, I ask the shareholders if it is a matter for surprise that for the last 18 months the results have been as they have?

Then, again, there is the engaging of labour by the manager, and it is a question, that of labour, as a shareholder I have taken a great interest in writing to the secretary in January, 1875, upon that point, I received a letter from our noble chairman, stating that two reliable men, well recommended, were about to proceed to the mines

as superintendents of labour, thereby giving the company the advantages that were derived by the native contractor, who had been getting the lion's share. We are informed that these men arrived, but the circumstances under which they left I have asked for information, but have been unable to obtain it; whether they knew too much or too little for the manager we are in ignorance. During the strike in Wales—March, 1875—I wrote his lordship as to the engagement of men on strike. The adjoining mine—the Javali—employing German labour, I submitted the question, and received a letter that the directors would feel obliged if I would find out on what terms young men on strike would be prepared to go to the mines. At my own cost I visited Wales for that purpose—Merthyr, Dowlais, and the adjoining district—advertised in one of the Welsh papers. A long correspondence was the result—many willing to go, but the wages asked were too high. Machinery without labour to work it (and I fear that is our case at present) is fatal to the interests of the shareholders. There can be no doubt if native labour can be had it is the cheapest and the best for our purposes. Mr. Belt, previously to his leaving the mines in 1872, the last of the 12 stamps at the San Domingo Mines having arrived, knowing that additional labour would be required to work them, was absent nineteen days for that purpose; he went to the province of Segovia, and at Ocotal Depilto and Totagalpu he succeeded in obtaining the additional labour that would be required; then, again, there is the question of absence in legal matters.

Having referred to the duties of our late and present managers, we have to look to the directors—that the engagements entered into are fulfilled, making a reasonable allowance for distance, postal communication, &c. On the question of labour I have frequently written during the last 18 months, but without a satisfactory reply to my enquiries. I must say that from our secretary I have always received every courtesy when at the office, and my letters have always been answered. The question, if asked by the directors of the manager as regards labour—if no reply is received it justifies a rebuke, and if persistently the information is resisted, then a dismissal would appear to be the natural consequence. Our experience for the last 18 months goes to show there is something defective in the management, otherwise gentlemen who belong to our staff at the mines would have informed the directors of mismanagement that was going on, and if such information was forwarded the shareholders would ask the question—Why? Eighteen months is a considerable length of time for a falling-off when there ought to have been a gradual increase of profits.

Mr. Smeddle writes the directors that his engagement being at an end, it is his intention to leave the mines, and he is asked to remain until another manager is sent out to fill his place.

I fear I have intruded upon your valuable Journal as regards space, and with your permission will go into further points that affect the interests of the shareholders in your next impression. W. B. P.

Bristol, Sept. 7.

SPANISH MINING TERMS.

SIR,—The late Charles Kingsley designated the Spanish "a manly language," affirmed that it was studied in his own family, and recommended all persons connected with literature and commerce to make the acquirement, because some of the richest commercial regions of the earth spoke the language. These remarks are applicable to persons in the mining interest. No countries so metalliferous—at least civilised countries—as those which are Spanish-speaking. Not only is Spain itself, and Portugal, where the language is so much akin to Spanish, highly mineral, but the greater part of the American continent—from the confines of Texas to Cape Horn—abounds in metals. The Portuguese language is spoken in the Brazils, a region as large as the United States; and the Spanish is spoken in Mexico, Central America, the republics of La Plata—from Montevideo to Assuncion, Chili, Peru, Bolivia, Venezuela—and with considerable purity everywhere.

Now that Spain is at peace she is once more on the road to prosperity, and her mines, especially of iron, lead, copper, and quicksilver, are becoming objects of speculation and media of investments; and the metallic resources of what once were Spanish colonies are practically unlimited. As mining reports from the Iberian peninsula and from South America so frequently appear in the *Mining Journal*, we will place before our readers the most common mining terms employed by Spaniards.

The phrases shaft, adit, and level, we are informed, are frequently used as in England.

The phrase contract is used, and an *avio* is a species of mortgage contract. Sums of money are advanced, the lender to share the profits for a limited time. The security in such cases is "the mine, materials, and moveables."

A *pertinencia* is the legal possession of a lode.

Socabon is sometimes used for adit or level.

Real de minas, a metalliferous district. *Veta*, a vein.

Veta madra, the chief, or mother vein.

Hacienda, a smelting house; and *haciendas de beneficio* are establishments for reducing ores.

Monton, a heap of ore crushed.

Carga is in Mexico 300 lbs. weight of ore or metal, and 25 lbs. in Peru. A *quintal* is 100 lbs. Spanish.

A *league* in land measurement is of the extent of 5000 varas. A *vara* is a little over an English yard—90 varas being equal to 100 yards. N.

SANDWELL PARK COLLIERY.

SIR,—Two pits, each 425 yards deep = 850 yards of sinking, which has taken 8 years, at more than 117*l.* per yard, or 12,500*l.* per year, or 240*l.* per week! We are told there has been no water of importance, no running sand, no trap rock, no cast-iron tubbing, no slips, in short, no troubles such as are common in like undertakings, and yet we are told to be thankful. One quarter of the time and money, in my opinion, ought to have been sufficient; and I for one having an interest shall look out for some explanation. What have the directors had? what has the engineer had—from first to last, in every way? That is the first step; and the second is, where and how have 240*l.* per week been expended? J. BROWN.

Chester, Sept. 4.

THE PLYNLIMMON AND CARDIGANSHIRE BLENDE MINES—No. II.

SIR,—Having addressed a letter on the latter subject some time since, I am very pleased to find that one of the properties alluded to—the Rheidol Mines—has made a start in dressing, and we may shortly expect to see a parcel for sale. These mines have produced very large quantities of this ore, at a rate of about 30*s.* per ton, and are capable of returning tens of thousands of tons again at the same price. All that is wanted is a small capital to put the mines into a proper course of working, portions having become dilapidated, and requiring timber to get to the different points where the ore is discovered. There are about 1000 shares of 5*l.* each unissued in this company, and anyone taking them would make such an investment as is not often to be met with.

In the same valley is the Tynyfron Mine, where very large quantities of this ore have been returned at 40*s.* per ton, without the aid of any kind of machinery, which have left a fair profit on working, as it was taken away at a tribute of 13*s.* 4*d.* in 1*l.* There is a large quantity of ore now at surface, and there can be monthly sales of 100 tons per month made from the backs over adit, at 2*l.* per ton, if machinery is erected, and as the level is extended the quantity can be increased to double the quantity named, at a profit of fully one-half. Surely properties of this sort will not long remain unwrought, notwithstanding the dulness of everything in the shape of speculating—for speculating it is not—it is a certainty as long as the price of blende keeps as it is, or even if it were to recede 50 per cent.

I am proud to be able to say that the late Caegynon has been taken in hand by a spirited company, who are pressing ahead with machinery, and will soon get the mine into a profitable state. It is now to be called North Rheidol, which name is appropriate, as it stands directly opposite and to the north of the Rheidol Mines.

One of the lead mines I mean to offer a word about is Plynlimmon, where it appears there seems to be almost a question whether it shall stop or go on. With courses of ore producing from 30*l.* to 40*l.* worth of lead per fathom it is to be hoped that the manager, by working it energetically in the few days allowed for allotting, or endeavouring to allot, the shares unallotted, will show what the mine is really capable of doing, and if the result is, as I expect it will be, most satisfactory, then if the shareholders will not have a profitable mine let them lose it, they will well deserve to do so, and let some party have it and work it who may deserve it. A good deal of this work has been and is still being carried on in this county, and it is high time to put a stop to such proceedings for the sake of the benighted shareholders and the community at large.

Aberystwith, Sept. 4. ABSALOM FRANCIS.

FOREIGN LOANS, ENGLISH RAILWAYS, AND CORNISH MINES.

SIR,—Experience has demonstrated the great inconvenience and expense attending sinking funds to national loans. The object, equitable and credible in itself, is the commendable desire to lessen and speedily to absorb debts, and thus to render them as temporary as possible. Still, the history of the past shows that the ever-increasing duties allied with Governments make such repayments practical in but few cases, and even in these it is difficult to foresee when it will prove convenient to do so. Hence, without exception, the cancelling of one loan has been the cause of another being issued, as may be instanced in the finances of Turkey, Egypt, Peru, and many other countries and States. We, therefore, have the principle involved in the issue of $300,000,000 United States Government 4½ per cent. Funded Loan, payable in quarterly dividends in gold, and issued at 103½ per cent. The proceeds of this operation are to be applied to redeem and cancel an equal amount of Five-Twenty Six per Cent. Bonds. This loan of about 60,000,000*l.* sterling is redeemable at pleasure of the United States at par after the expiration of ten years; thence it is not likely that the market value will advance much above the price of issue—103½—as, in the case of repayment in the year 1886 at par, even if the quotations advanced to 110, 1 per cent. per annum must be deducted from the 4½ per cent. interest for loss of principal, and thus the average dividends would be reduced from 4½ to 3½ per cent., or (say) within 7*s.* 6*d.* per cent. of the present price of Consols. There can be no doubt of the success of this loan, as at 103½ many of the insurance, banking, and financial institutions of the country will become large and ready subscribers, as for the period of ten years the interest is certain to be close on 4*l.* 7*s.* per cent., while, in case of certain redemption, it will prove to original subscribers 1*l.* 0*s.* 6*d.* better than Consols.

The greatest boon and advantage which our railway companies have received in respect to finance was the conversion of floating and terminable debentures into preference stocks. These debentures, termiable at three, five, or seven years, were a sad drawback to the progress and success of railway works, as it frequently happens that new debentures were difficult to place when most necessary to obtain funds, while occasionally the inconveniences were so great as to involve an entire breakdown. Those who advocate sinking funds in foreign loans know well the attraction they have for most investors. There is in them the element of the old lottery loans, and which are no longer legal in this country, and to an extent they are in contravention of the law. They do without doubt aid the issue of doubtful securities, and third-rate borrowers may consider any expedient warranted, but solvent and progressive countries should follow the examples of England, then America, and not their inferiors, as, for example, Turkey, Peru, and Spain. We do not advocate the issue of permanent stocks when credit is low, but the redemption rights which are most advantageous should be such as rest with the English, American, and French Governments, the issuer alone having the right to pay off at par after a given period, and escape exists from the serious mischief of sadling a country in its early days with debts bearing rates of interest out of proportion to the credit they may hereafter attain, or otherwise raising itself again from the misery and degradation to which France was subjected under the presence and pressure of the Germans. Again railways, through the creation of preference stocks to repay off debentures, saved the companies immense costs in premiums, doucers, commissions, and other losses inseparable from constant renewals, say nothing of the number of lawyers, employees, and factotums involved in the ever-existing struggle for credit and existence.

That mines conducted upon the Cost-Book System, as now exist in Cornwall and Devon, create an uneasy feeling in the minds of the general public all must admit having the slightest knowledge of finance and the principle of unlimited liability. That mines in former times were safely and honourably conducted upon the Cost-Book System is most undeniable, and, in fact, 40 years ago the principle governed by the Stannary Court was unquestionably the best suited to their wants and purposes, but then the shareholders in mines were almost entirely local, and the companies consisted mostly of 64 or 128 shares. Carn Brea and Tincroft, with two or three others, forming the only exceptions thereto. Tresavean, Dolcoath, United Consols, Basset, Cook's Kitchen, East Crofty, North Roskear, Seton, Botallack, South Caradon, West Caradon, Friendship, Levant, St. Ives Consols, and East Pool were originally constituted in 64 to 128, and not exceeding 256 shares, and calls made from time to time to meet the expenditure authorised and approved of by the persons interested, and who attended in person to audit the accounts and to sanction further outlay. At this time debts would not accumulate unknown, the channels of credit were limited, and the working fully discussed and criticised, but now the case is altered, and the shareholders are mostly non-residents, and wholly ignorant of the operations, and the state of the finances, save from the information conveyed in the quarterly or half-yearly circulars forwarded to them, while it must be confessed that the intelligence which these convey is often not only meagre, but vague in the extreme.

That the Cost-Book System is unlimited responsibility all practicals know, and they also know that the distrust in Cornish mining arises chiefly from the practices of the Stannary Court, the dread of merchant influence, coupled with the incomplete statements of accounts and plans of future conduct conveyed to the absent shareholders and the general public through those scanty and all but valueless circulars. Remove this distrust, and the chief drawback to the progress of *bona fide* mining will become virtually extinguished; and pray how is this to be effected? The answer is obvious. Let the managers of Dolcoath, Cook's Kitchen, Tincroft, Carn Brea, East Pool, Wheal Basset, Botallack, Owles, and other great and important mines throw open their accounts and show the true statement and position of affairs. Why should not all the transactions of a Cornish mine be kept by double entry? Surely the clerks have not too much to do. Stock should be kept of materials, fuel, and plant, and their value set forth and published. The reserves of ores should be estimated, and the quarterly discoveries and quantities wrought added and deducted; and then a balance struck and the result shown in each quarterly circular. Again, as in the cases of Tincroft and Carn Brea, when in August the accounts are audited to the end of March only, the costs outstanding for April, May, June, and July should be stated, the merchants' bills for the same period produced and added thereto; also, in addition, the computed costs for August, September, and October, with merchants' bills added, then probably we should arrive at a sum approximating to the true position of the indebtedness at the date of the next quarterly audit in November; deduct from this total the tin sold in the interim, and we arrive at the true position of the company's affairs.

This is only a hand-to-mouth position after all, and is simply what the shareholders have every right to demand from the executives. If a company be a private partnership, and in no way partaking of a public character, then the world has nothing to do with its affairs. It may prosper or come to grief, no one has a right to interfere, but in public companies, such as those to which we have referred, and which possess no capital save the yield from the workings, the greatest care should be taken to exhibit the true positions of liabilities and assets, or distrust will forever prevail. Who is likely in these days, when physical tests are applied to every description of industry and of commerce and trade, to remain credulous and inert in respect to Cornish mining. It is too absurd to be entertained for one moment. And now that the formerly remunerative mines surrounding the Carn Brea Hill are worked as a whole at a heavy monthly loss, it behoves the executives of the several companies to be in a position at any moment to strike a balance and show to shareholders the actual financial position. Why should mines prove an exception to other pursuits? Why cannot clerks keep stock, expenditure, and assets books by double entry? Every respectable company, firm, and individual do so, and if they do not they usually come to grief.

The uninitiated fully comprehend Cornish "Cost-Book" mining and its mode of finance. What the public require is "fair weather and the absence of fogs." The Cornish motto "One and All" must prove in practice what it professes to be in spirit; then capital will be attracted to its mines, especially to the utilisation of low-priced ores, and the separation of different ores contained in the same stone or matrix through the use and aid of chemistry. Thus a bright future looms in the prospective for those who possess industry to search, and knowledge to avail themselves of the dormant wealth that lies in every direction. At present South Caradon and West Tolgus are the only two dividend copper mines in the West. As to tin mines, the majority is worthless as far as the investor is concerned, though for the interests of Cornwall they may prolong a struggling existence, still another year or two will see most of them in their dotage. There is want of spring and elasticity—*i.e.*, life and soul—in landlords, merchants, and executives, and thrown unaided by foreign capital on the resources of the mines alone they will unquestionably collapse. Though noisy as "crickets" they become as feeble and powerless as "grasshoppers" without legs.

79, *Cornhill, London, Sept.* 6. R. TREDINNICK,
Consulting Mining Engineer.

OOLA HILLS MINES, IRELAND.

SIR,—I noticed in the Supplement to last week's Journal a commentary by Mr. Champion on Mr. G. Henwood's letter of the previous week concerning the above mines, and, as I twice examined the property in question and made a thorough survey of it, I beg to make a few remarks. My last visit to the mines was paid in June last, and I then saw in the plat near the bottom of the midway shaft (an entirely new shaft 28 fms. deep) a lode 12 ft. wide, composed of flookan for 4 ft., by the footwall back of which was carbonate of lime and barytes over 3 ft. wide, containing veins of argentiferous galena of superior quality from 1 in. to 4 and 5 in. wide solid, and the gangue well spotted with ore besides. As the ground looked at that point it would yield about 2 tons of ore per fathom. The lode, which is called the adit lode, can be traced for over half a mile through the property, and wherever opened on has shown unmistakeable indications of good courses of ore in depth. It was largely worked by the ancients above the water level, and their stulls may now be seen from the adit level upwards to the very grass. This eastern portion of the mine is decidedly the best, and was never touched by modern workers till an enterprising Birmingham gentleman about 4 years ago took up the estate and commenced operations in a spirited and miner-like manner, and I have no hesitation in saying that if the company now formed follow up with vigour his plan of operations and extend to their superior agent full power to carry out the same, Oola will, in my opinion, prove a great success. I know neither Mr. Henwood nor Mr. Champion, but in justice to the property named I cannot remain silent under the circumstances, and am obliged, from conviction, to decide in favour of the former's remarks regarding the sterling worth of these mines. If Mr. Champion knows Ireland he must also know that it has never had a fair trial. Two great evils have been the bane of Irish mining—1. Too limited capital having been subscribed for developing its mines.—2. Their management, in most instances, having been placed in rude and homespun hands that were not worth a rap when removed from their own native mines on the other side of the Channel.

Campiglia, Italy. THOMAS TONKIN, M.E.

BODIDRIS MINING COMPANY (LIMITED).

SIR,—You did me the honour of admitting to the Journal some letters of mine concerning lead mines and the lead markets, and reference was made in them to a new company entitled the Bodidris, and to the excellent property it was formed to acquire. The prospectus of the company is now published, and lies on my desk. I will ask your permission to make the Journal the medium of bringing its salient features under the notice of the mining public in general, and of the investing public at large, and of those capitalists who contemplate acquiring property in lead mines. The whereabouts of a mine is always the first consideration of those who are invited to subscribe, as that consideration generally involves geological characteristics, facilities for operating in the search for ore, and the means of bringing it to market. The Bodidris property is situate in Wales, in the county of Denbigh, and the parish of Llanarmon-in-Yale. It is held under grants from Sir W. W. Wynn, Bart., Mrs. Foulles, and Mr. L. Adams. The extent of the estate is considerable, and is thoroughly pervaded by lead ore. It ranges about 1½ mile, or between that and 1½ mile on the course of the lodes. It embraces the old Craigoig Mine, so well known in that part of the Principality. To the southward of this the property is worked upon a new lode. These two lodes form a junction within the sett, where the chief wealth of the property is supposed to lie, and to which operations will now be directed.

The enquiry is most in order here—What are the characteristics of the surrounding country? The lodes now wrought upon are parallel to those of the celebrated Minera Mine, which for the last 17 years returned an average of 100 tons of lead per week, and paid in dividends to the shareholders about 600,000*l.* Mr. William Francis, a mining engineer of reputation, says of the Bodidris:—"The general advantages pertaining to this property are of very considerable importance." * * * "As to the geological features—the most important in dealing with the prospects of a mining property—the stratification is the carboniferous limestone, extending from the well-known Talargoch Mines at the extreme north to the well-known Minera Mines, near Wrexham, on the south, containing a sectional area of country in which all the renowned mines of Flintshire have been developed, and in which, within the prescribed limits of such sectional area, every main lode hitherto worked has proved very productive, so that I have no hesitation in saying with the greatest confidence that the geological position of this property is everything that can be desired, and eminently satisfactory in every particular, so that having main lodes here found I could have no doubt whatever of their proving rich when fairly laid open. I should say, further, that the mine adjoins the formerly rich Westminster Mine, which during my remembrance returned 250 tons of ore monthly, and has far exceeded this quantity. It is also in the neighbourhood of the present rich Minera Mines."

With regard to the quality, character, and resources of the property itself, the same competent authority pronounces "there are in this sett three main lodes of a character so strong as to pierce every stratum of the metal-producing sectional area of rocks, and from a careful examination of their surface lines I find that they form a junction at a point where hitherto no workings have been prosecuted, and this fact alone would have enabled me to say without the slightest hesitation that great courses of lead ore would undoubtedly be found at their junction, and from thence eastward, but I find from actual operations now being carried on that this opinion is verified in the strongest manner, and from a combination of features observable throughout I am enabled to say with the greatest confidence that a great discovery of ore has been made. I could scarcely have expected to find such a strong and tangible proof of the anticipated bodies of ore being found in the junction." The facts stated by Mr. Francis, and the opinions he expresses, have been confirmed by numerous competent engineers and captains, such as James Nancarrow, and Walter Eddy, of Liverpool, and Messrs. Williams and Kyrke, mining engineers and surveyors.

So far it is made evident that the geological peculiarities of the site, and the actual development of ore on the property itself, prove that the mine is unusually rich in lead. The directors are themselves competent men of high reputation and position, and they are

pledged on the face of the prospectus to the truth of these descriptions. There has lately been felt a want of water in connection with Welsh lead mines, the summer having been so exceedingly hot. This want is never felt at Bodidris, and there is never any unmanageable abundance; coal is plentiful, and by road and rail the facilities of carriage are ample, both for bringing requisites to the mines and taking their products to the best markets. It is especially worthy the consideration of purchasers of shares of the Bodidris Lead Mining Company that in consequence of the discoveries already made the usual cost for exploration does not exist, and returns will be made, increasing in magnitude while further development is proceeding.

Since my last letter on Prospective Lead Mines, which appeared in the Journal, the price of lead is higher, and it quietly, gradually, and steadily rises. Several of your correspondents last week pointed out the indications presented of a revival of trade in most foreign commercial centres, and of a larger home consumption beginning to show itself. Of course all the metal markets and all mining for metal will improve, and even iron rise from its low estate. Undoubtedly lead for the reasons given in my other letters, which need not be here repeated, will profit most. But altogether independent of such prospects we can sell any amount of lead ore which we are able to raise now at very remunerative prices. There is, therefore, in the shares of the Bodidris Mining Company no mere speculative outlay, but a certain investment in a working, workable, rich, and remunerative metallic mine, yielding lead ore of the most excellent quality.—26, *Finsbury-place, City.* JOSEPH J. REYNOLDS.

NORTH TRESKERBY MINE.

SIR,—A meeting of the shareholders was held at the account-house on the mine on Tuesday last to adopt measures for the more effectually developing this property. Many shares having been relinquished by persons who could not afford to meet calls, and, owing to other circumstances, it appeared advisable to appoint a committee—Capt. R. Pryor, with Messrs. Phillips, Arnold, and Tregoning being the gentlemen ultimately chosen—to consider the position of the mine, and suspend or continue operations as they may think fit. From what I can learn, the shareholders at the meeting, feeling confident as to the ultimate success of the working, were almost unanimous in their determination to give the mine further trial. Your readers will remember that the mine in former years yielded many dividends out of profit, and would be doing so now if the rich copper lode under water could be operated on. The pumping-engine was worked to the extent of its power, and could keep the water in a dry season, but not otherwise. The rich copper lode dips eastward—*i.e.*, the rich bunch—and was opened some hundreds of fathoms west of the engine-shaft, so that to work it at all was very costly and inconvenient. Owing to these circumstances it became necessary to erect a powerful engine considerably east of the old engine, and to sink a new engine-shaft to take the lode at a depth of, I think, about 100 fms. from surface. Accordingly an engine of 80-in. cylinder, called Doctor's engine, has been erected on Doctor's shaft (so-called after Dr. Whitworth, St. Agnes, a large shareholder from the commencement), and the shaft has been sunk about, I believe, 50 or 60 fathoms (I speak roughly). Before the company incurred the cost of that engine they wisely secured additional ground at the west of the original sett. The ground so secured was called Scorrier Consols, a shallow mine containing many tin lodes (which are also in North Treskerby), besides the rich copper lode of North Treskerby. The tin reserves in Scorrier Consols and North Treskerby are said to be large, but now that tin is so low in price to get down to the rich bunch of copper is the primary object of the manager, at least I so understand it. As there is so little of what is called speculation involved in this enterprise, I have no doubt that the disposable shares will be speedily appropriated after the prospectus (if any needed) has been placed before the public. The engine-shaft doubtless will be sunk in lifts with all possible expedition to get at the copper ore, and then, or soon after, I shall look out for a resumption of dividends. In all the arrangements Capt. R. Pryor has shown, in the opinion of lookers on, the soundest discretion, and he should, I think, have a substantial testimonial from the company immediately after the declaration of the first dividend. R. SYMONS.

Truro, Sept. 7.

RAILWAYS IN CORNWALL—No. IV.

SIR,—At the time that the Cornwall Railway and the Central Railway plans were being prepared, in 1845, a third competing line was started, called the Great Western and Falmouth Junction Railway. It was to be connected with the Bristol and Exeter line at Exeter, and to take a tolerably direct course to or near Bodmin, thence by Roche, Tregoss Moor, along the River Fal, by Ladock, to Truro and Falmouth—a broad-gauge line.

The late Mr. I. K. Brunel, after the deposition of the plans and sections of this line, went, I was told, to inspect them to see if he could prefer the line to his own, and, if so, to take it instead, but he found that the cuttings and earthworks set out were so immense that he would have nothing to do with the project; he preferred his own. Speaking of cuttings, I may astonish your readers by informing them that in one place there was a cutting of three or four miles in length, averaging about 50 ft.! The engineer wanted to show a long level line! I suggested to him an easier line, but he was offended at my interference, which was well meant, for I felt assured that such a section was not likely to be sanctioned by a Parliamentary Committee. I believe the scheme did not reach the Committee, having dropped through for want of funds. The solicitors for the Bill were Mr. John Stogdon, of Exeter, and Mr. Thomas Harvey, of Falmouth. Mr. Stogdon was drowned whilst bathing in the River Exe, about ten years ago; and Mr. Harvey died in London about three months ago. The engineer was a gentleman of Exeter; whether he is alive or dead I cannot say. I contracted for the survey of about 40 miles of the line at 20*l.* per mile, but I had to sue the directors for 730*l.* of the amount, and all I could get was 0! I had no evidence to prove that the directors did anything; it was a nominal direction only. So I not only lost the amount due, but had to pay 80*l.* law costs. I had three assistants engaged six weeks at a guinea per day each, and travelling and hotel expenses, very heavy, to pay. I have heard that the engineer was bankrupt a little while afterwards, but I have kept on my legs.

The Central Railway Company honorably paid every creditor (of whom I was one) in full, and so, of course, did the Cornwall Railway Company. When the rage for railways was existing (in 1845) the late Mr. George N. Simmons, of the then firm of Passingham and Simmons, solicitors, Truro, projected a railway from St. Agnes to Truro. The prospectus was a very specious document, and brought more orders for shares than could be supplied. Why the shares were not allotted I could never discover. The engineer sued Mr. W. H. Paddon, then of Truro, merchant, for the amount of his claim, and recovered 500*l.* Paddon was one of the directors, and took an active part in the promotion. This line was to start from Trenunnance Quay, St. Agnes, and come to the western side of Truro. A locomotive line between those points would not pay working expenses; it is well, therefore, that it was not carried into execution.

About the year 1852 the late Mr. T. Darke, of the firm of Messrs. Gould, Darke, and Cornish, solicitors, Penzance, projected a line of railway from Penzance to St. Just, and caused it to be surveyed, and notices were given in the papers, as required by the Standing Orders of Parliament, of the intention to bring in a Bill, but I think the Bill was never introduced to the House of Commons. Since then the parish road to St. Just has been made a turnpike road. It is, therefore, not likely that a railway will soon unite those two places. There is less inducement now than there was in 1852, supposing no turnpike existed, because most of the mines have failed, for without numerous mines as customers a railway could not pay, the population (about 10,000) being insufficient to maintain a railway. The population is chiefly dependent on the mines for subsistence, so that, many of the mines having been abandoned it is likely to lead to a further diminution of the number of people. The mining parishes in general are fast losing their inhabitants by emigration, except, perhaps, Camborne and Illogan.

About 1830, when Great Wheal Vor was in the zenith of its prosperity, the company employed the late Mr. R. Thomas, C.E., of Falmouth, to make a survey for a line of railway from Hayle to that mine, but it was never adopted—*i.e.*, executed. The mine worked till 1844, all the carriage being done by horse labour, over steep roads. I remember that in the early days of Wheal Vor most of the carriage was done by mules, of which Mr. Richard Tyacke, then of Godolphin, kept about 100, which used to carry the coals, &c., in sacks on their backs, and carry away the produce (tin) in like manner. The working was resumed in 1851. In the year 1852, I surveyed a line, and prepared plan and section thereof, which I submitted to the manager of the mines and the late Mr. Nicholas Harvey, at Hayle. They decided to adopt it in case the mines became a success, which they never did, so my labour was lost. My line went by Wheal Vor to Helston, which town is still unsupplied with railway.

Truro, Sept. 4. R. SYMONS.

PROJECTED CANALS IN CORNWALL.

SIR,—I have before me Mr. Absalom Francis's letter in your Journal of the 2nd inst. I well remember the projection of a scheme of a canal from Hayle to Mount's Bay. I thought, however, that it was more than 40 years ago, and that the late Wm. Moody, C.E., of Penzance, was the engineer. I will not dispute Mr. Francis's date, but agree with him that such a work would result in the prevention in the course of years of a great loss of life. It would also probably answer as an investment of capital.

This reminds me of another projected canal at an earlier date, of which the late Mr. Wm. Moody was the engineer. It was a canal from Hayle, *via* Nansegollan, to Helston. I remember seeing the printed plan, dated, I think, about 1810. Like most other projects it fell to the ground.—*Truro, Sept. 4.* R. SYMONS.

CAPITAL, AND ITS EMPLOYMENT.

SIR,—That there is an immense amount of money lying dormant, only waiting opportunities for its safe and profitable use, is proved by the very favourable returns issued from week to week by the Bank of England, by the insignificant amount given on deposits, and (in spite of the possibility of an Eastern embroglio) by the high price of Consols and other Government securities. This plethora of money is due to two causes—first, to the absence of business; and, second, to the general distrust which has taken possession of the minds of many investors. To the latter cause, however—speaking from my own experience—I attribute the present stagnation. And no wonder when one considers the immense losses that have been sustained by investing in what was known as the "public's favourite securities"—Foreign Bonds. How great these depreciations have been in the course of little over a twelvemonth may be ascertained from the following significant figures:—

Stock.	Dealt at in 1875.	Price this day.
Egyptian, 1864	£101¼	£49
ditto 1868	85⅞	46
ditto 1873	81⅜	47
Peruvian, 1870	73¾	17
ditto 1872	57½	14
Turkish, 1858	67½	15
ditto 1862	75	14
ditto General Debt	45¼	13
ditto 1865	72¼	14
ditto 1871	68¼	27

Space will not allow me to lengthen this list, but enough has been shown to illustrate the immense amount of capital that has been lost in these "favourite securities." Moreover, it must not be forgotten that the above, and many others, are in that interesting, though hapless, condition known as "in default of dividends"—an infectious malady very prevalent just now, and which, in most cases has, to my thinking, assumed a chronic form. Then, as to another security highly prized, and even now greatly inflated—Railways—they also show a serious depreciation, not so marked as the other, but still important, and ominous enough when one balances falling dividends on the one hand with increased expenditure on the other. There are, however, opportunities for the employment of capital which have yielded in the past, and will yield in the future, good and substantial returns. I allude to two classes of home industry—Mining and Trading Companies. And, *en passant*, I must mete out a dole of credit to the conductors of this Journal for the steady perseverance with which they have ever advocated home enterprise. Would that the money so freely tendered to rotten Governments and insolent Republics had been spent in developing our own resources.

I cannot upon this occasion, however, enter sufficiently into the merits of either of the two enterprises selected by me, and will reserve much that I have to say for future occasions. As to mining, its results are too well known to require repetition from me. But what I wish firstly to impress upon all who have embarked, or are likely to embark, upon this area of investment is the stern necessity of having primarily ample capital for the development and proper working of their property. This is one of the great secrets of mining success, as may be ascertained by the examples of Great Laxey, Van, Tankerville, and many others, all of which owed their fortune to the fact of their having been supplied with money in no grudging manner. There are at the present time many mines only waiting for capital to make them the successes that the above are—the consideration of which I leave for another occasion.—76, *Old Broad-street, London, Sept. 7.* ALFRED E. COOKE.

[For remainder of Original Correspondence, see to-day's Journal.]

ROYAL CORNWALL POLYTECHNIC SOCIETY.

The forty-fourth annual meeting of the Royal Cornwall Polytechnic Society has been held in the Polytechnic Hall, Falmouth, during the present week. The exhibition has been of exceptional merit. Almost every department was unusually well filled, and some were exceedingly attractive. The fine arts were well represented, and the show of photographs the finest ever seen in connection with the society. There was likewise a magnificent display in the ornamental art department, including fine collections of Torquay terra cotta, Doulton stoneware, Sgraffito and Lambeth faïence, Stiff and Frys (Lambeth) stoneware, and terra cotta from Messrs. Phillips, Aller. Naval architecture was fairly represented, but natural history was inferior.

But it is the mechanical department with which the readers of the *Mining Journal* are chiefly concerned. And this, we are glad to say, was decidedly above the average, the entries being numerous and important. There were no boring machines, which is perhaps not to be wondered at, seeing that so many have been exhibited in previous years, and that the arrangements for the competition under the auspices of Mr. Basset and the county committee are in progress. There were, however, two very important forms of dressing apparatus, and an entirely new form of the direct-acting pump, besides a number of minor, but still highly important, exhibits.

The Patent Self-Acting Mineral Dressing Machine Company (Limited) exhibited one of their patent dressing-floors in small model and in quarter-size working model, manufactured by Mr. Green, of Aberystwith. The advantages claimed for this arrangement are numerous and important, embracing the following points:—Greatest cheapness in first outlay, saving of three-fourths of the space usually occupied by dressing-floors, economy of 60 to 70 per cent. of the labour in dressing, and 5 to 10 per cent. of the ore now lost. Moreover, the machines make the ore clean at one operation. They have stood the test of experience, many having been supplied to leading metalliferous mines both in this country and abroad. While adapted to the concentration of lead, silver-lead, zinc, gold, and copper ores, it is especially fitted for the concentration and dressing of argentiferous lead ores, containing blende, copper, and iron pyrites, making a clean and complete separation of the metals from each other and from the gangue. Expense is saved by the fact of its being entirely automatic in its action. It takes the stuff directly from the crusher, classifies and dresses it, and the only labour required is in feeding and removing. The stuff passes from the crusher, first, into a series of revolving classifiers or riddles (Green's patent), each covered with perforated iron plate. Perforated pipes inside each classifier or trommel lead in water to wash the stuff. All that passes through the plate of one classifying trommel is discharged into the next in succession, while the sized product retained is discharged through a shute into a jigger specially adapted thereto. From the trommels the finer stuff is led away in a launder to a buddle, but is still further classified on the way by the single action of gravity in a couple of catches, each of which a shute leads to a jigger. The jiggers are self acting, divided into three compartments by transverse partitions. A vertical partition extends along the upper part of the compartments, and on one side there are a set of plungers or pistons to produce the jigging motion of the water, whilst a series of sieves are placed on the other side. On the top of the partitions there are fixed a number of standards to carry a longitudinal shaft on which the eccentrics are fixed, and which, being connected by rods to the plungers, put the water in motion. The separation is effected by the jigging action of the water, with which the hutch is filled, and which is made to work up and down through the sieves by the plungers. A layer of ore is put on the sieves, which has the effect of allowing particles of the same specific gravity as itself to pass through, while it keeps back any particles of less specific gravity, which last are gradually washed over the end from each compartment to the next lower one, the light waste from the last compartment finally passing away. A suitable appliance for regulating the stroke of each plunger is attached. The buddle works in the ordinary way. The judges were unanimous in commending the excellence of this arrangement, and, in recognising the efficiency and economy of the washing, awarded the apparatus, therefore, the society's first silver medal.

The other dressing apparatus shown was entirely novel, the invention of Mr. Henry Taylor. It has been tried for a couple of months at Minera, on stuff from eight of Collom's jiggers, and has produced most satisfactory results, being capable of dealing with upwards of 30 tons of stuff of the gravity of blende in a day of ten hours. The machine is known as the Patent Drum Dresser, and is, as stated, entirely new in its character and arrangement. The model shown worked very efficiently. The machine consists of an arrangement of conical drums, telescopically fixed, and mounted on friction rollers, or on an horizontal axis, so as to allow of their being rotated by steam or other power. In the interior of these drums is formed a variable screw thread, the pitch and depth of the threads being greatest at the larger and gradually diminishing towards the smaller end. At the smaller or higher end of each drum is introduced a stream of water. The material to be treated is fed continuously into the larger or lower extremity, a short distance up the cone, and upon the machine being made to rotate the tendency of the threads of the screw is to carry the material up the inclined slope of the drums; but, meeting with the streams of water flowing from the upper end, a separating action is produced, the rotary motion of the machine constantly exposing the whole of the material for treatment. The lighter particles being washed over the notches formed by the threads are deposited at the lower extremities of each of the drums in proportion to their specific gravities, while the heavier particles of ore gradually settling in the threads are carried up against the stream and deposited at the opposite end of the drums furthest away from the feed. The dresser can be adjusted with the greatest delicacy by altering the flow of water, the speed of the machine, and the angle which the lower portion of the cones form with the horizon, and so regulating the velocity of the flow of water over the threads. The quantity of water used is not large—about 60 gallons per ton of stuff, and the power required to drive the machine is small. This machine the judges regarded as a wholly novel arrangement, which seemed to work effectually, and promised to be of great usefulness. They awarded it, therefore, a first silver medal.

Tangye's Compound Condensing Steam-pumping Engine is a very valuable improvement on the old form of direct-acting steam-pump. The cheapness, handiness, and general efficiency of the direct-acting steam-pump have caused several thousands of them to get into use. They have given every satisfaction in all points except economy of working, the consumption of coal being much larger in proportion to the work done than that of the ordinary pumping-engine. Messrs. Tangye, of Birmingham, have aimed at making the direct acting steam-pump an economical machine, and this they have effected most admirably by the adoption of the compound principle on the patent of Mr. Cherry, of their works. The steam is now used expansively, the cylinders effectively steam-jacketed, the least possible quantity of steam is used throughout the engine, friction is reduced to a minimum, and the whole arrangements are the simplest possible. The consumption of coal has been reduced to about 4 lbs. per horse-power per hour, and the cost of the engine is only increased some 10 per cent. So far as the details can be explained without a diagram they are as follows:—The low pressure cylinder surrounds the high-pressure, the low-pressure piston being annular, and having two piston-rods, which are attached to the same cross-head as the rod of the high-pressure cylinder. The high-pressure cylinder is accurately fitted into the low-pressure, with a space between them forming a steam-jacket or case filled with live steam, from which the heat is radiated into both cylinders. The distribution of steam to both cylinders is effected by a single slide-valve, the passages for the high-pressure cylinder being formed in the cylinder covers. At the end of the valve-chest are short cylinders containing pistons, which are both cast in one piece with a connecting bar having steam passages formed in it. From this bar a cylindrical boss projects downwards, and enters a suitable hole in the main valve, to which any motion of these two pistons is thus communicated. The boss on the connecting bar is hollow, so that it forms a connection with the exhaust cavity of the main valve.

On the back of the main valve is a small supplementary valve, which is capable of moving transversely to the line of motion of the main valve, and which has on its back projecting lugs placed obliquely, and having a sliding block fitted between them. A finger depending from a short rocking shaft takes hold of this sliding block. The rocking shaft passes out through a stuffing box at the side of the valve chest. Outside the valve chest the rocking shaft carries a forked arm, having adjustable contact pieces, which at the ends of the stroke of the main pistons are struck by a pendulum lever, which is connected by a link with the main cross head. This valve gear acts as follows:—When the main pistons are approaching one end of their stroke the pendulum lever strikes one of the contact pieces on the forked arm carried by the rocking shaft, and partially rotates that shaft. This movement shifts the sliding block on the back of the small auxiliary slide valve, and causes that valve to move transversely. This transverse movement uncovering one of the auxiliary steam ports admits steam to one of the short cylinders at the end of the valve chest. This admission of steam shifts the main valve, and admits live steam to the high-pressure cylinder, at the same time placing the same end of the low-pressure cylinder in communication with the opposite end of the high pressure cylinder. The main pistons then commence their work. But immediately the auxiliary valve begins to move it is, through the effect of the inclined slides at the back shifted so as to cut off the steam from the short cylinder in question. The effect of this is that the quantity of steam admitted to the auxiliary cylinder at each stroke is only that sufficient to start the main valve, the remaining movement of the valve being effected by the expansion of the steam in the auxiliary cylinder. By a very simple arrangement the auxiliary pistons are cushioned. This consists of a tube in each auxiliary cylinder, which fits and slides in the corresponding steam passage leading thereto, the tube being perforated so that the steam can pass out from its interior into the cylinder. The movement of the corresponding piston covers the perforations in the tube before the end of the stroke is completed, and thus shuts sufficient steam into the cylinder to form a cushion. The whole arrangement of the gear is most simple and ingenious, and during numerous long and severe trials the pump has worked most satisfactorily, and while worked at the Royal Agricultural Show at Birmingham was highly approved by mining engineers. One result of this has been has been an order for a colliery in Durham of a pump to force water 1042 ft. in one lift. The great value of these improvements was recognised by the award of a first silver medal.

Baker's Rotary Pressure Blower, which had a first silver medal last year, has been considerably improved by the introduction of a diaphragm. This lessens the noise and enables a higher pressure to be attained. In fact, at Philadelphia a blower is now steadily giving a pressure of 5 lbs. of water. No medal could be awarded this year, in accordance with the rules, but the judges expressed their high approval of the improvement.

Mr. Husband, of Hayle, sent a couple of new safety-valves. Husband's Improved Dead-Weight Safety-Valve consists of an ordinary spill valve beating on a brass seat, the weights instead of being situated above the valve are placed around and below it in the form of rings, resting on a collar or cradle working on a guide, and connected by a knuckle joint to the valve. The advantage of this arrangement is that no undue strain can be brought to bear on the valve from the oscillating motion of the ship, and consequently there is less liability of leakage and damage to the valve. Another great advantage is that by simply lifting the bonnet of the valve box the valve is open to inspection, and can even be taken out, examined, and replaced, without removing the weights. Such advantages as these are of the greatest importance, and they are thus obtained simply and cheaply. Had the Thunderer been so fitted the fatal explosion in all probability would never have occurred. Here a second silver medal was awarded.

Husband's Paradox Mercurial Safety-Valve ingeniously takes advantage of the fact that that the pressure of a liquid on any surface is due entirely to the height of the liquid and the area on which it rests, independent of the quantity of the liquid employed. This is the principle in hydrostatics known as the hydrostatic paradox, and Mr. Husband has applied it in a very effective manner to the safety-valve. The arrangement consists of an ordinary safety-valve, on which rests a cylindrical vessel containing a small quantity of mercury, a hollow plug or pole is pressed into the vessel, and the mercury rises in a thin film around it. By this means a column of any desired height can be obtained, and a pressure commensurate with that height exerted on the valve. When the valve rises the mercury rises, collects in a cup above, and freely flows back again when the valve falls. In the model exhibited 2 lbs. of mercury were used and a pressure obtained of 12½ lbs. on the valve, but much greater pressure in proportion to the weight of mercury used would be attained in larger valves. The advantage claimed is that the weight is brought down close on the top of the valve, and no undue strain can arise from the movement of the ship. The judges regarded this as an exceedingly ingenious application of a scientific principle, but reserved their final judgment until it had been tested in practice.

First Bronze Medals were awarded to Pfidierer's Kneading and Mixing Machine which is adapted to a wide variety of uses, and operates by the feathering action of a pair of elliptical plates; and to Wavish's Coal Economisers. These latter are plates of iron fitting the bottom of the grate, with a pierced cylinder rising into grate space. By this means the air is carried into the very heart of the fire, and complete combustion secured.

The Uskside Company, of Newport, Monmouth, sent one of their admirable Winding-Engines for underground haulage, on Stevens's patent. It is designed to be worked either by compressed air or steam, and is especially fitted for collieries, though there are mines in Cornwall in which it might be found of great utility. The chief object is to supplement the machinery in use for winding up the main roads of collieries, by substituting mechanical for horse power in hauling to the main roads. It is very compact and portable, requires no foundations, and is extremely simple in its arrangements. The drums, which work on the second motion, are loose on the shafts, and have independent brakes and a clutch for throwing them in or out of gear. All handles are brought together at the back of the engine, which can easily be managed by a lad. Instead of loose drums the engine can be fitted for working with endless chains, or with clip drums for endless rope. A second silver medal was awarded.

Mr. Dingey, of Truro, the inventor of the pulveriser, exhibited a new Winding-Drum, fitted, in addition to the ordinary break, with a sliding friction clutch of a new pattern. Four arms lie not quite in a plane perpendicular to the main axis, each terminating in a pallet sliding in guides. A very slight movement of the working lever causes these arms to come more closely into the plane, and consequently increases their speed, causing them to bite the inner surface of the drum. A sliding weight working upon the actuating lever enables the person in charge to give just the proper amount of friction for general work, but any extra amount may be instantly applied by applying pressure to the end of the lever, which may be done from any distance by a rod or wire connection. The inner rim of the wheel is of cast iron turned, and the pallets of the sliding arms also turned, but cast hollow and filled with lead to secure friction. This was commended.

Mr. J. Letcher exhibited an exceedingly ingenious and much-improved Theodolite for mine surveying, which is better adapted for practical use in this direction than either the surveyor's theodolite or ordinary dial. Portability and stability are two of the chief advantages secured, and hence great accuracy is obtained. The needle can be read in a direct north and south line when the instrument is set up for taking the vertical angles to as great accuracy as in any other position. The slender vertical arc is dispensed with, and the suspension arrangements, while quite as steady as the surveyor's theodolite, leaves the face of the instrument open without obstruction. It can be manufactured on a large scale without addition of weight, or increasing the size of the case. The judge awarded 2*l.*

Williams's Petent Self-Sustaining Rope Pulley Block is the best of the kind that has come under our notice. The rope passes through a clutch, wedge shaped, which fits into a box. The box is hinged so that the rope can be hauled at any angle, but the weight can only be lowered by holding the hauling-rope either to the right or left. If the rope slips the clutch is carried up into the box and wedged upon the rope, gripping it so firmly that the descending of the weight is at once stayed. The whole arrangement is exceedingly simple, and not at all likely to get out of work. There is a great advantage in the adoption of the principle to a rope instead of a chain, which is likely to bring it into much more general use. First bronze medal awarded.

Messrs. F. Erskins's New Patent Smokeless Furnace and Economiser is a noteworthy invention, the novelty consisting of peculiarly constructed fire-bars resting directly on tubes arranged in such a manner that heated air is admitted into the furnace in such proportions as to secure combustion of the gases before the smoke is acturally made. The air is so greatly heated as to generate the steam quickly and give a steadier supply. The bars also afford more air space, which secures the entire consumption of the fuel and considerable economy.

The Bridgewater Engineering Company exhibited Korting's Undergrate Steam-Jet Blower.

Weare's Method of Extinguishing Fires in Ships received a second bronze medal. This apparatus consists of a box on wheels, containing hydrochloric acid, and the lixing substance chosen for the generation of carbonic acid gas, which can be moved to any part of the deck required, and then connected to pipes which pass into the

hold. The gas descends partly by its own weight and partly by the force with which it is generated; and as, unlike water, it does not damage the cargo, the the hold of a ship could be filled with gas as a fire preventor.

Mr. Sinclair's Dust, Smoke, and Mining Respirators were awarded a first bronze medal. And the other awards included first bronzes to Morrison's Patent Indicator Slam-Lock for Railway Carriages; Scowfield's Patent Railway Door Handles, which also shut with slamming, exhibited by Messrs. Rownson, Drew, and Co.; the Improved Hedley Dial of Messrs. Davis and Son, Derby; Sidebotham's Patent School Desk, manufactured by Larmuth and Co.; the Remington Type Writer; Messrs. Pooles Keyless Mechanism for Fusee Watches; and Edison's Electric and Autographic Pen. While second bronzes went to Asbury and Baker's Patent American Mills, Prout's Improved Gate Latch, and Sara's Improved Reamer. Mr. Edward Borlase had a special premium for his efforts in the direction of the utilisation of hitherto neglected Cornish clays.

One very interesting and valuable feature of the exhibition was the fine display of the highest class Scientific Instruments, exhibited by Messrs. Lent, Dallmeyer, Hiljer, Cetti, Casella, Davis, Lownes, Browning, and others. The Aneroid of Messrs. Davis, of Derby, in addition to being exceedingly sensitive, has a special feature in an altitude scale, ranging 12,000 feet. This scale is divided into 10 feet, which again is subdivided by a vernier into 10 parts, so that heights can be read to a foot. The general collection included spectroscopes, anemometers, lenses and photographic apparatus, chronometers, marine clinometers, pendulums and escapements, and meterological and marine implements in large variety.

Mr. Vosper, of Plymouth, exhibited a new form of Sewing Machine, combining plain-stitch, overseam, herring-bone stitch, and button-holes. For this combination a first bronze medal was awarded.

Mr. BASSET (the president) delivered his inaugural address on Tuesday, and in the course of his remarks made special reference to the boring machine question. He said—I hope it will not be considered inopportune if I briefly refer to a subject in which I am undoubtedly deeply interested, but which is, I believe, also felt to be of paramount importance to the general interest of the county. I referred to the great depression of our mining interests, and expressed in general terms what I believed to be the principal causes of that depression, and the sources to which we could look for its relief, and as a means of effecting this I suggested a premium of 500*l.*, to which I would contribute 200*l.*, being offered through this society for any boring machine capable in an appreciable degree of expediting and economising the sinking and driving of Cornish mines at a depth of not less than 100 fathoms from surface. The experience of the twelve months that have since elapsed has only further confirmed the opinion I then expressed that we must look to cheapening cost of production rather than diminution of foreign supply for restoring to capital invested in Cornish mining that reasonable return without which it will inevitably be withdrawn; but liberally as my suggestion was met and supported by particular individuals, especially the Duke of Bedford and Lord Robartes, it did not appear to meet with the general adoption I anticipated, and a variety of circumstances, some personal and some practical, which were not at first sight apparent arose, and induced me, with the subsequent concurrence I believe I may say of Lord Robartes, to withdraw my offer, and endeavour to effect the same object, though in a different manner, by forming a fund for giving an actual trial to a different and more powerful boring machine than any hitherto experimented with in the county. The managing agents of all the principal mines in the Camborne district have shown great alacrity and zeal in cooperating with me for this object, and a guarantee fund is being formed for giving an effectual trial to the Diamond Rock Boring Company's percussion drill, which I hope very shortly to see carried out under the able supervision of Capt. Teague, who has set an example of public spirited liberality by the very liberal contribution of 100*l.* to the fund. There was a meeting held at Tincroft yesterday, at which it was ascertained that the amount necessary to be guaranteed will in all probability be not less than 1000*l.*, and very probably as much as 1400*l.*, towards which at present we have been promised the following amounts:—From myself, 300*l.*; Lord Robartes, 100*l.*; Capt. Teague, 100*l.*; Mr. Pendarves Vivian, 30*l.*; Sir F. M. Williams, 25*l.*; Mr. John Williams, 25*l.*; Trustees of Mr. Tyringham, 25*l.*; Messrs. Bolitho, 25*l.*; West Basset Adventurers, 2*l.*; Mr. Hawkins, 20*l.*; Mr. Enys, 5*l.*; Dr. Le Neve Foster, 1*l.* 1*s.*; and Mr. Henderson, 1*l.* 1*s.* I cannot allow myself to think there will be any difficulty in obtaining the balance from the numerous other landowners, adventurers, and merchants in the county interested in mining, but no effort or reasonable further contribution on my part shall be wanting to complete our arrangements. At our next anniversary, therefore, we may reasonably hope to be acquainted with the result of this important experiment, and if it should then appear that the mining interests of the county can be further promoted through the agency of this society by revising the idea of premiums, or in any other way, I shall be only to happy then to continue my support to such an object. I am unwilling to appropriate the time of this assembly any longer with what is unavoidably somewhat of a personal statement, but I was anxious that the explanation of a withdrawal of a proposal made by me in this hall should be to those unacquainted with the intervening circumstances as public as the proposal itself.

A vote of thanks to Mr. Basset was moved by S. J. A. AUBYN, M.P., and seconded by Mr. A. P. VIVIAN, M.P., who highly eulogised the public spirit which the President had shown, and expressed a hope that the experiments would shortly be conducted to a successful issue.

Mr. RICHARD TAYLOR, who also spoke, referred to the fact that his brother and himself had engaged largely in experiments with boring machines, and at a considerable cost. They were now about to try the Ullathorne. Hitherto no machine had exactly answered, but all had merit, and he felt convinced that Cornishmen would find out a way to overcome the difficulties which at present existed. Mr. Taylor expressed the pleasure which he felt at seeing the important department of ore dressing so well represented as it was in the exhibition, but directed attention to the necessity of something being done to improve the general condition of the steam-engines, which had very much fallen back, and the condition of some of which was anything but creditable.

On Wednesday the annual meeting of the MINERS' ASSOCIATION OF CORNWALL AND DEVON was held under the presidency of the Rev. SALTREN ROGERS. There was a large attendance—the largest ever known. Mr. J. H. Collins, F.G.S., the honorary secretary of the Association, wrote expressing his regret at being unable to attend, in consequence of an engagement at the British Association, and adding—"It is very satisfactory to me to see the flourishing state of our classes, the number of successful students having more than doubled in the last three years. In one respect this is a very serious matter, since our funds have remained about stationary, but I hope this will no longer be the case. It would be too bad to be brought to a condition of bankruptcy by our very success. The Miners' Association has for more than 10 years advocated the introduction of boring machines into the Cornish mines, and has diffused no small amount of information on the subject among the miners. It is, therefore, gratifying to find that, partly in consequence of the discussion at our last annual meeting, a borer has now been got to work at Dolcoath, which seems likely to be a success in point of economy as well as speed. The thanks of all metal miners are undoubtedly due to Capt. Josiah Thomas and the adventurers of Dolcoath Mine, in addition to all others who have worked in the cause. Mr. Robert Hunt, Mr. J. St. Aubyn, and Mr. Basset also regretted their inability to attend.

Mr. A. P. VIVIAN, in conveying the regret of the gentlemen last named, appealed earnestly for additional help. It was very odd that the society should be endangered by its very success.

Mr. WILLIAM GRYLLS read the report of the council, who reported that, notwithstanding the increased depression in mining, the work of the association had been carried on more vigorously than ever. This was shown by the volume of Proceedings just issued, and by the lecturer's report. The *Mining Journal* prizes, which are always greatly valued by their recipients, had been awarded this year as follows:—Inorganic Chemistry, to William Hodge, of the Camborne class, who passed first class in the advanced stage and laboratory practice: Mineralogy, to Cornelius Beringer, who also passed first-class in the advanced stage; Principles of Mining, to Edward Skewes, of the Beacon class, who took the high position of second class in honours. For Geology the prize had not been awarded, as no pupil took a sufficiently high place in the examination on that subject. In the lecturer's report read last year reference was made to the successes of Mr. William Jago, of the Hayle class, which led to his gaining one of the Government nine months' scholarships at South Kensington. During this period he has been receiving instruction in chemistry from Professor Frankland and Mr. Valentin, and in the competitive examination which was held at the conclusion of the course he took the second place, thus justifying the remarks of Mr. Kitto in his last year's report. During the past session practical mining surveying has been added to the subjects taught in the classes. Capt. Maynard has been instructing a class of 11, with thoroughly satisfactory results. The want of a good laboratory at Redruth or Camborne has been experienced for many years, but the want is now in course of being supplied by the liberality of Mr. Basset, who has erected a suitable building at Camborne. The funds of the Association are now quite insufficient for the increased number of students, and the council recommended as a partial mode of overcoming the difficulty that the special council prizes hitherto given shall not be offered in future. The usual annual excursion of the combined classes had taken place that day. Instead of going to some mining district, as usual, the students had visited the Polytechnic Exhibition. The constant increase in the number of successful students was very noteworthy, the numbers for the last three years being as follows:—1874, 97; 1875, 189; 1876, 207. Unfortunately, the subscriptions and donations had remained almost stationary, and the council again urged each member to bring in additional members. The two years' term of office of Mr. W. Cole Pendarves had now expired, and the council recommended the election of the Rev. Saltren Rogers as his successor as president. Messrs. W. C. Pendarves, G. L. Basset, J. P. Budd, and Richard Taylor were recommended as vice-presidents, and Messrs. F. V. Hill, W. Pike, and J. F. Penrose as members of the council.

The report was adopted on the motion of Mr. A. Taylor and Mr. C. Fox.

Mr. B. KITTO, F.G.S., the lecturer, in his report said that analising the reports of the examiners to the Science and Art Department at South Kensington for 1875 he found that all who passed in the first class of the advanced stage of mineralogy in the United Kingdom were from the Miners' Association classes, while seven out of the nine who passed first class in the elementary stage were also from those classes. In the principles of mining two out of the five who obtained first class in the advanced stage, and all who passed first class in the elementary stage, were also pupils in the classes. Of Queen's medals the only one awarded for mineralogy. One of the two given for steam, and one of the four given for inorganic chemistry were received by students in the classes of the Association. The list of successful students in this year's May examinations shows that the interest taken in the subjects has not diminished. The number under instruction was 242 in 12 classes. The total number of passes obtained was 207, the proportion taking first-class being very few, while Edward Skewes, a working miner of Beacon class, obtained the very creditable position of second class in the borers competition on the principles of mining. During the year machine construction had been taught for the first time, and with most satisfactory results. The instruction was given to a large class at Hayle, by Mr. Thomas E. Bickle. Surveying has been taught by Capt. Maynard, of East Pool, and if the Government had conducted an examination on this subject he felt confident the results would have been equal to any, but it was not in the list of the science and art department. In July your lecturer, together with Messrs. Barnett, Gill, J. Bickle, Letcher, Allen, Skewes, and T. E. Bickle, district teachers, visited the loan collection of scientific apparatus at South Kensington, by invitation from the Science and Art Department, the Government paying their railway fares to and from London. Mr. William Jago, late district teacher, Hayle, has taken a high position in the list of those in training at South Kensington, and hopes to gain another nine-months course of instruction there. A substantially built laboratory, erected by Mr. Basset, at Camborne, will soon be ready for the use of the advanced members. Mr. J. A. Phillips, Dr. Le Neve Foster, Mr. C. Fox, and Mr. J. H. Collins, had presented books to the library, and mineral specimens for the use of the classes had been received from Capt. Maynard and Dr. Le Neve Foster.

The PRESIDENT (Mr. Rogers) delivered an exceedingly interesting address, in the course of which he reviewed the several important matters connected with mining affairs. More than 1000 passes had been gained by the Association pupils, and he felt that the society ought to be more largely supported. They wanted in Cornwall a good deal more of the associated spirit in the conduct of experiments and investigations which were intended for the benefit of the whole mining community. However, there had been advancement in several directions, and he was glad to know that so many borers were about to be practically tried—not only the Barrow at Dolcoath, but the Beaumont at Carn Brea, while the Darlington had been tried at Wheal Agar, and Capt. Tregay, he believed, had a borer also. He did not believe that borers would altogether supersede hand-labour, but he was glad they were coming into such competition. It had been suggested that wind-power might be utilised in the vast mines to pump up sea water to reservoirs to give water-power. And why could they not in inland mines pump up water to surface instead of adit, and use it to drive water-engines at the adit level? There had been considerable advance in explosives, though here, as in other matters, mines might advantageously combine to try experiments for themselves. In stamping machinery he did not think the old steam-stamp had yet been beaten. In dressing, however, there was a very great deal more to be done. In conclusion, Mr. Rogers called the attention of the students to practical matters for study. He recommended among other subjects mechanics, the study of alloys; and in mineralogy, a search for cobalt, uranium, and nickel. In all these studies they had not only the utilitarian principle, but the enlargement and elevation of the faculities.

The Barrow Borer, by Capt. Josiah Thomas. This rock-drill was patented by Messrs. Hosking and Blackwell, of Sutton, near Barrow-in Furness, formerly of Cornwall. It is made of gun metal, and is 120 lbs. in weight. The length, including socket for the borer and handle for advancing the machine, is 2 ft. 9 in. The piston is 3 in. in diameter, piston-rod 2 in., and length of stroke 5 in. The advance motion is done by hand, the man in charge advancing as far as the nature of the rock admits. The machine is fixed on a horizontal hollow bar 4 in. in diameter, and capable of being fixed to bore in any required direction. The total weight of bar, with clamps and couplings connected therewith, is 1 cwt. 3 qrs. The machine has been at work for several months in Dolcoath at the 314 fm. level under adit, 343 fms. from surface. Air is compressed by a small steam engine at surface, and is conveyed down the engine-shaft through a 2 in. wrought-iron pipe, and through the level to the end, 40 fms. west of shaft, through a 1¼-in. iron pipe, with a few yards of india-rubber tubing attached to the end of the pipe and screwed to the machine. The pressure is generally kept up to about 50 lbs. to the inch, which has been found on the whole most effective. When first tried the machine was not sufficiently strong for the hard ground, and was frequently getting out of order and requiring repairs. Thus the driving was only as fast as hand labour. The patentees have since taken out a contract to drive the 302 and 314 at the same price as hand labour, with 10 per cent. premium for driving twice as fast. The present machine is now 50 per cent. stronger than the first, and the 314, has been driving for eight weeks. In the first four weeks the patentee drove 4 fms. 6 in., in the past four weeks 5 fms. 8 in. Two men and three boys are employed altogether. The utmost that the same five could have driven by hand would be about 2 fms., so the fact was established that a machine could drive 2½ times as fast as hand labour. The relative cost has not actually determined, but Capt. Thomas thought that two or more ends could be driven at the cost of hand labour, while the speed would be even greater than yet attained.

Mr. LOAM in reply to a question stated that on calculation it had been found cheaper to supply the power from the surface than take it in the shaft.

Mr. C. FOX pointed out that the machine was self-ventilating, and that it thoroughly purified the end.

Mr. A. P. VIVIAN asked the size of engine with which the borer was driven?

Capt. THOMAS replied that it was a 16-inch engine, but that would drive two or three machines.

Mr. VIVIAN also referred to the evidence given before the explosives committee as indicating advantages on the part of dynamite and guncotton. Tonite did not come before them. The honourable gentleman enforced the need of strict economy in this as in all other matters, and again pointed to the need of working the steam engine (the Cornish type of which could not be beaten) in the best manner. As to the work of the students he should like to see other subjects forced to the front as well as mineralogy, so as to prepare the young men for other brauches of occupation than mining.

Capt. A. JAMES held that if miners were properly encouraged they would drive a good deal further than 2 fathoms a month. He said nothing against the boring machine, but held that their own miners should have the same chance.

Capt. THOMAS replied that the men at Dolcoath had had premiums offered them, and even as much as 12 months extent, so that Capt. James' remarks did not apply to that mine. Had not Capt. James better try his proposal himself?

Mr. LOAM called attention to the fact that the machine both purified and cooled the air. This was an important matter for the health of the miners. The Barrow borer was a proved success.

Mr. TAYLOR pointed out the very great advantage that was likely to be derived from the boring machine in the greater rapidity with which the work would be executed. It ought not to be necessary to offer premiums to men to do the ordinary work of the mine. It might in special cases be advisable, but it was calculated to make men exert themselves too much.

Dr. OXLAND called attention to the fact that in America boring machines were doing most efficient work.

Mr. J. H. HARRISON read a paper "On Taylor's Drum Dressing Machine" for washing or separating ores and substances of different specific gravities, and sizing material after it has been previously ground or otherwise reduced and prepared for treatment. The machine has been designed for the purpose of concentrating ores from their gangue with greater simplicity and rapidity than any apparatus yet introduced, finishing ore which would otherwise have to be dollied, buddled, or otherwise be treated by hand; also for sizing material in a more perfect manner than can be done by sieving or other like purpose, and for separating and washing out sluices from the coarser particles of stuff which may require re-grinding or crushing. The dresser, from its extreme ease in manipulation and thorough manner of working, is also an excellent coal washer. The machine consists of an arrangement of conical drums telescopically fixed and mounted on friction-rollers on a horizontal axis, so as to allow of their being rotated. In the interior of these drums is formed a variable screw-thread, the pitch and depth of the threads being greatest at the larger and gradually diminishing towards the smaller ends. At the smaller or higher is introduced a stream of water. The materials are thrown into a hopper, a worm driven by the shaft and cone pully securing a regular supply into the machine. Upon the machine being rotated the tendency of the thread is to carry the material up the inclined slope of the drum, but meeting with the stream of water issuing from the pipe a separating action is produced, the rotary motion of the machine exposing all the particles over and over again to the action of the water, the lighter ones being washed over the notches formed by the threads are deposited at the lower extremity of the first cone, while the heavier particles, gradually settling in the spaces between the threads, are carried up against the stream and deposited in the next drum. The same result is produced in the two other drums after the first partial separation, but in a more marked degree, the threads of the screw being of firmer pitch and not so deep, and the slope of the sides being steeper, the capacity of the spaces beween the threads is less, and owing to the finer pitch of the screw the material is left a longer time exposed to the action of the water, and so a most searching separation is obtained. To assist still further the separating action of the machine the screw threads in the lower end of the drums are deeper than those of the smaller end, so that although the material fed into the machine may fill the threads in the larger end of the cone, by reason of the rotary motion this quantity is constantly being compelled to overflow the threads higher up, and so the water is able to overcome any large particles which might otherwise by their size, independent of their specific gravity, be carried up by the thread. The conical form of the drums is also specially designed to assist in a most important manner the action of the water, by allowing the stream, which is deep, contracted, and consequently rapid, when flowing over the heaviest particles at the smaller end to gradually spread itself out, decrease in rapidity and depth, and so give time for the small grains of heavy material to settle themselves again in the threads instead of being washed down with the lighter particles. If the machine were made cylindrical this property would be lost. At the largest extremity of the lowest cone have been constructed, and are in successful operation at the Mineral Halvans Dressing Company's works, near Wrexham. These machines are now treating successfully the jig stuff containing only 2 per cent. of blende, and are capable of getting through 3 tons of stuff per hour of the density of blende. The quantity of water used in the operation is in the proportion of 600 gallons per ton of stuff, so that a most favourable comparison is made in this important item alone with other dressing machines.

"Oxland and Hocking's Calciner," by Dr. Oxland, F.C.S. At the Polytechnic meeting, in 1849, the Society's silver medal was awarded to Oxland and Hocking's calciner, which had then been in operation for some time in the treatment of the ores, in order to the separation of sulphur and arsenic, and of opper ore for the extraction of arsenic. Since then many have been erected in Cornwall and Devon, and in South America, and arrangements are being made for their use in the United States, Australia, Mexico, and Canada. The experience gained having led to the verification of the expectation entertained concerning them, it was thought desirable to call the attention of the meeting to the invention, the prime motives of which were economy of labour, fuel, time, and plant. The calciner consists of a tube made of wrought-iron boiler plate, lined with fire-brick, supported on two pair of friction wheels, made to rotate by a cogged wheel surrounding and attached to the tube, driven by water wheel, turbine or steam-power. The tube is inclined for ¼ to ½ in. in 1 ft. The lower end passes through the wall of a chamber enclosing the fireplace by which the tube is heated, and the winkle into which the calcined ore is delivered from the tube. The ore is carried up and thrown over through the heated gases passing through the furnace. The back end is enclosed within a chamber partitioned off for the reception of dust blown over by the draught, and of the products of combustion passing off from the tube, and communicates with dry and wet condensers, and flues leading to the chimney by which the draught is maintained. The back chamber is covered with iron plates, on which the raw ore is dried and warmed before being fed into the tube through a small slanting pipe passing through this floor of the flue into the interior of the tube down to within 1 in. of the fire brick lining. In working the economy of the heat is effected by every particle of the ore being lifted up and mixed with the heated gases, which, passing along the inclined arch of the tube, give off a large portion of the heat, which being absorbed by the brick is carried down below the charge of ore transmitted to it, and thus utilised. At Devon Consols it has been satisfactorily proved that the combustion of the ore in the calciner can be maintained without the use of coals or other fuel, which shows that the calciner may be used, as originally purposed, for the manufacture of sulphuric acid from pyrites smalls, and it may be advantageously applied by mines that have been in the habit of sending to the smelter large quantities of arsenic with their copper. The largest, at Devon Consols, 6 ft. in diameter, heats 25 tons per day.

"On the Himmelfahrt Mine, Freiberg," by Capt. J. Garland, F.G.S. There are statistics of this mine extending back to 1524, and in the sett, which has an area of a little over a square mile, there are 14 shafts, whose united depth is 2431 fms., or about 2¼ miles, and levels driven having a total length of 113,827 fathoms, or 130 miles. The cost of driving has reached 772,470*l.* In 1874 silver, lead, and other ores were raised amounting to 13,533 tons, while the number of hands employed was 1877, an exceptionally low number, as there are generally between 2000 and 3000. Since 1852 the total amount paid in dividends has been 375,442*l.* The lodes occur in gneiss, of which there are two varieties, the grey and the red, the grey being the most productive. Usually the gneiss is a hard rock, with a regular slaty structure. Running through the sett, south-west to north east, is an elvan dyke, 5 to 10 yards wide, passing through which the lodes are generally split up into a network of branches; 829 silver bearing lodes have been discovered in the gneiss of the Freiberg district. The lodes at Himmelfahrt are divided into two classes—the pyritous lead formation, and the barytic lead formation. The former strike south west to north-east, and underlie 40° to 85° north-west, in exceptional cases dipping south-east. They vary in width from ½ in. to 3 ft., and consist of quartz, gneiss, argentiferous galena, arsenical iron and copper pyrites, blende, and lesser quantities of other minerals. Of this class 17 lodes are wrought. The lodes of the barytes lead formation intersecting these are from 4 in. to 3 ft. in width, consist of barytes, calcite, fluor-spar, spathose iron, galena, poor in silver (the galena of the other lodes average 64 to 71 ozs.), copper, and iron pyrites. Their bearing is south-east to north west, and dip 60° to 50° south-west. Except where they intersect they are totally unremunerative, but at the intersections they sometimes yield silver ores, and even native silver. The mine is worked in the usual way. The present depth is about 292 fathoms. The bottom levels are under water, and will not be drained until the completion this year of a deep adit, which with its branches will be 27½ miles in length. The most productive part of the mine is that between the 110 and the 22 fm. levels. In the bottom levels the more valuable products have greatly fallen off. The dressing appliances are extensive and good, and separation effected by a cobbing hammer as fine as possible. The cobbed ores are classified into prill lead ore, arsenical mundic, iron pyrites, copper pyrites, blende, crusher stuff, fine stuff, stamps work, and deads. Most of the ores contain a small percentage of siver. From 1524 to 1871 the metals extracted from the ores raised were:—silver, 500 tons; lead, 47,692 tons; copper, 1081 tons; zinc, 1878 tons; sulphur, 6824 tons; arsenic, 1805 tons: value, 3,859,596*l.*; dividends, 487,898*l.*

Mr. S. BENNETTS read a paper on Curtis's Pulveriser, now at work at Penhalls Mine. Its construction is very simple, and its efficiency is all that can be reasonably desired, both as to the motive power required and the work accomplished. The machine in this case is attached by cog-wheels to the end of the stamps axle, and is so regulated as to work ten revolutions to one of the stamps axle, or at an average speed of 120 revolutions per minute. The under disc revolves, and has on its surface six slots and several holes sunk into its depth to within ¼ in. of being through the disc. These slots are for the conveyance of the sand from the hopper in the required quantity, and also for regulating the degree of fineness to which it is desired it should be pulverised (and consequently the less the quantity discharged), so that the requisite degree of fineness may be easily obtained from any class of stuff by simply plugging up the outer portion of these slots with a piece of iron. The upper disc simply rests its weight on the lower one when at work, and is prevented from revolving by two slots working loosely over a bracket fixed to the framework. By means of two screws it weight is on all occasions lifted off the lower disc by a boy in attendance whenever the stamps stop, and is not again lowered until after the machine has been set in motion. This in practice was found a very necessary precaution to prevent the teeth of the wheels being broken. A pair of disc will last from four to six months, and the upper one is weighted as it becomes worn. When kept working at the speed of 120 revolutions per minute it will pulverise 13 tons of the hardest capel sand in this mine in 24 hours sufficiently fine for the extraction of all the tin work, a result which formerly required 12 stamp-heads to accomplish, and by no means in such a satisfactory manner. In stamping much of the tin ore is pulverised too fine, and consequently lost, and this cannot well be avoided, as the specific gravity of the ore tends to keep it under the battery longer than any of the substances associated with it, but with the pulveriser the specific gravity is nothing to do with it, and consequently much less slime tin produced—a very important consideration.

THE UNITED STATES COAL TRADE.

The Correspondent of the Times, writing from Philadelphia (Aug. 22) says—Coal has monopolised attention for the last few days, almost to the exclusion even of politics. On Aug. 22 the great "coal combination" dissolved, and since that time there has been a panic in coal shares, the speculation in New York and Philadelphia being carried on upon a large scale, and depressing the values of many other securities. The "coal combination" was the most gigantic trading monopoly in the country. It represented $200,000,000 capital, and was composed of the great railway, canal, and mining companies, which are the chief producers and transporters of coals. It has become the custom in the anthracite regions for the transporters to be the coalowners, and they not only directly produce the greater part of the supply, but, through managing the transportation to market, they can control all the individual coalowners. In this combination were the Lehigh Valley Railroad, Philadelphia and Reading Railroad, Delaware, Lackawanna and Western Railroad, Pennsylvania Coal Company, Delaware and Hudson Canal Company, and Central Railroad of New Jersey. These corporations, through lessees and otherwise, control many other companies, and practically—so long as they agree—can have the management of our anthracite coal trade in their hands. But they could not agree; hence the disruption. The object of the combination, which was formed nearly four years ago, was to control the amount of production and the prices at which coals should be sold. Every month prices were fixed, and to each company an allotment was made of the number of tons to be shipped to market. This went on swimmingly until the financial crisis paralysed manufacturing, and thus reduced coal consumption. The associated companies then had to reduce their production, and this they did resolutely all through last year and for the earlier part of this year, the process becoming more painful at every step. The public naturally made an outcry that coals did not fall in price when most other articles were declining, and buyers held off, and began to offer temptations to the companies to "cut under" each other. The severe pressure of the times finally provoked a disagreement among the companies. The Lehigh Valley Railroad, while not violating the agreement itself permitted individual shippers to send as much coal to market over its line as they pleased, and thus month after month it exceeded its allotment. This was complained of and was not remedied, and the result was a dissolution. The coal companies have since apparently formed into two factions, the Lehigh Valley being joined by the Central Railroad of New Jersey on the one side, while the Reading Company has the other three corporations with it. Now they are intending to fight each other, and huge auction sales of coal will result, 500,000 tons being offered by the Reading Company and its associates on Aug 29. The break in the combination has caused a sharp decline in all the coal shares but Reading, that being maintained by wealthy operators, who have to day managed to "corner" their opponents and send it up. The contests in the Stock Exchanges this week have been among the fiercest ever conducted in this country, involving enormous transactions. Everyone expects to see a sharp decline in the price of coals as a result: but everything will be unsettled until the forthcoming public sales fix a basis. There are large amounts of idle coals awaiting sale at all the shipping ports, and if they can be turned into money it will be of advantage. One unfortunate immediate result of the disruption of the "coal combination" was the stoppage of work in many collieries, coalowners not desiring to go on until they could foresee the future. This will make the distress in the mining regions worse than it is, and add to the difficulties to be contended with.

BORAX LAKE AND SULPHUR AND QUICKSILVER DEPOSITS OF CALIFORNIA.

At the meeting of the Centennial Committee of the American Institute of Mining Engineers, on Aug. 3, Mr. W. S. KEYES, of Nevada, who is one of the judges in the department of mining and metallurgy at the Exhibition, gave quite an interesting account of Borax Lake and Mineral Deposits near Clear Lake, in California, which he had recently visited. Clear Lake lies about 65 miles north-west of Susian Bay, the latter being one of the branches of San Francisco Bay. The lake, which is about 25 miles long, has a north-west and south-east direction, corresponding with the trend of the adjacent mountain ranges. Its outline is quite irregular, being long and narrow at its lower end, while near the middle an arm about 4 miles long projects towards the east. The upper end of the lake widens out and forms an irregular area of about 30 square miles. The country surrounding this end of the lake is formed of high hills, which are composed of rocks supposed to belong to the Cretaceous period. On the south-west and south-east side of the lake the rocks are of volcanic origin, being in most part composed of compact lava with small amounts of pumice and disintegrated scoria. Thermal springs are found in these rocks, which give evidence of the more active influence which once were exercised there. The great geysers, which lie about 15 miles to the south-west, are probably in the same belt of volcanic rocks. In 1856 Dr. J. L. Veatch discovered that the water of a small lake about 4000 ft. long and 1800 feet wide, which lies in the neck of the land included between the southern end and the eastern arm of Clear Lake, contained a considerable amount of borax. The amount of solid matter contained in a gallon of water was found by analysis to be 2491 grains, of which 281 grains were dry borax. Investigations, which were soon made by means of cofferdams sunk in the bed of the lake, disclosed the fact that there was a layer of blue mud about 18 in thick containing crystals of borax, which bed covered the lake bottom. The deposition of the crystals was irregular, some portions of the mud deposit not containing any. In 1864 a company was formed to extract the borax from this mud, and so successful were they in their operations that in a short time they stopped all importations of the article from abroad, and brought its price down from about 25 to 10 cents per pound. An operation similar to the killing of the goose which laid the golden eggs was undertaken by the company, which put a stop to their operations. With the hope of striking springs which supplied the lake with concentrated borax water they put down a bore-hole which, unfortunately for them, struck a strong vein of pure water, and soon increased the body of the lake to such an extent as to prevent them from working the borax any longer.

SULPHUR AND QUICKSILVER DEPOSITS.

Mr. Keyes then spoke of a mineral deposit which, with regard to its composition and method of occurrence, was not paralleled, so far as he knew, anywhere else in the world. This is a deposit of what was thought to be native sulphur, and which was first discovered at the extremity of the bay on the east side of Clear Lake. This deposit, which has since been traced towards the east for over 3000 ft, lies along on both sides of a fissure through which, in several places, thermal springs containing bicarbonate of ammonia, free carbonic acid, chloride of sodium, bicarbonate of soda, and free silicic acid have been discovered. Explorations which have been made to a width of 1000 ft. across this fissure have shown that there is a top deposit from 2 ft. to 3 ft. thick, which is composed of disintegrated lava, mixed with a small amount of sulphur and cinnabar, yielding from 1 to 1½ per cent. of mercury. Under this decomposed lava there is a bed of impure sulphur from 6 to 8 ft thick. The amount of sulphur in this layer varies from 30 to 80 per cent., the sulphur sometimes being in nearly pure lumps of considerable size. The gangue material mixed with the sulphur is a lava similar to that found in bed above. Lying beneath this sulphur deposit is a bed of lava, which has been found to contain from 1½ to 2½ per cent. mercury in the form of cinnabar, and also a little sulphur. This bed has been investigated to a depth of 75 ft. without discovering its bottom, and is found to cover nearly the whole area along and across the fissure of 3000 by 1000 ft. The first effort which was made to work any of these deposits consisted in an attempt to refine the sulphur found in the sulphur bank, by distilling it in the ordinary manner in retorts. Repeated efforts to do this were unsuccessful, owing to the necks of the retorts becoming stopped up by something, the nature of which was not then recognised.

This afterwards proved to be a small amount of cinnabar which was mixed with the sulphur. The attempt to work the bed was soon given up, and no operations were carried on again at the deposit until 1874, when the Sulphur Bank Mining Company commenced working both for the sulphur and the mercury.

NEW PROCESS OF SULPHUR EXTRACTION.

The process employed for extracting the sulphur is a novel and exceedingly simple one. The apparatus used consists of an inverted T retort made of cast-iron, and having an oval section. Doors which can be luted are made at the top and front ends of the retort. Inside of it a perforated plate of sheet lead is placed on the bottom, underneath which are openings through which steam can be admitted. The bottom is set so as to slope towards one end, and at the lowest point there is a discharge pipe for drawing off the semi-refined sulphur. The method of operating the retort is as follows:—Lumps of the impure sulphur are piled on the lead bottom before described, this being done from the end doors. After the lower portion is filled in in this way the vertical portion or shaft has the finer parts of the impure sulphur thrown into it The doors are then luted on, and steam, at a pressure of 31 lbs. to the square inch, is admitted through the holes in the bottom of the retort. This soon permeates the mass of the sulphur material, and at the pressure of 31 lbs. its temperature is just that required to render the sulphur liquid. The sulphur, when melted, runs down through the perforated plate, which prevents the passage of the gangue material, and collects in the bottom of the retort. When sufficient has collected it is drawn off through the discharge pipe. The valve used to close this pipe is jacketed, so that the sulphur is kept in a melted state by the steam, such as is used in the retort. The slight amount of fine dirt which unavoidably runs down with the sulphur through the perforations in the lead plate, alone prevents it from coming out in a perfectly pure condition. One great advantage in extracting the sulphur in this way is due to the very low heat employed, which is not sufficient, as in the ordinary refining process, to cause the sulphur to attack the iron. The residues which remain are afterwards treated for the cinnabar which they contain. The sulphur is shipped to San Francisco, the freight costing at present $10 per ton.

For extracting the mercury from the cinnabar, three apparatuses are used. The richer specimens of ores and residues are put in retorts with lime, as is commonly practised at New Almada. The less pure ore, which is found in lumps, is worked in continuous furnaces, in which it is filled up so as to admit the flame from the combustion chambers between the interstices. The fine ore is worked in a modified Herstenhöfer furnaces. In these continuous furnaces the mercury is condensed in iron chambers, from eight to ten of which are used for each furnace. It is found by experience that the larger each of these chambers are made the less "soot" of mercury will be formed.

The passage of the mercurial fumes through these chambers is assured by means of suction currents produced by Root's blowers, and the draught afforded by a high chimney, to which all the condensers are attached. With regard to the probable amount of mercury in this deposit, Mr. Keyes said that according to the estimates of Mr. J. D. Hague, and Messrs. Ashburner and Price, the portion already exploited—3000 × 1000 ft.—contained from 1 and 1¼ to 2 per cent. of the metal. This was for a depth of 75 ft., there being no indications that the deposit did not extend even deeper than this. Mr. Vincent, an English engineer, estimates that the same one contains 2 and 2½ per cent. of mercury, which would make it have a value of $40,000,000 at 50 cents a pound. The easy method of mining which is employed being nothing more than quarrying in benches combined with the simple furnaces used for extraction, have enabled the Sulphur Bank Company to produce the mercury at an exceedingly low price. Mr. Keyes said that it could be made as low a cost as 18 cents per pound. At the time of Mr. Keyes' visit a few months ago, there were from 20,000 to 30,000 tons of the lower cinnabar deposits ready to be roasted. Besides this deposit, another similar in character has been discovered on the other side of the lake, which is owned by the same company.

—Special Report of the *Engineering and Mining Journal* (New York).

THE QUICKSILVER MARKETS.

The rapidly-increasing quicksilver production of the State of California, and the corresponding decline in the value of the metal, have powerfully contributed to stimulate the production of gold and silver, especially the latter. While quicksilver ranged between 80 c. and 1.33 gold in California, as was the case from 1871 to 1875, the poorer ores could not be worked to advantage, and, but for the extraordinary richness and abundance of ore, both gold and silver, in the Comstock Mines of Nevada, dear quicksilver would have meant a decreased output at least of silver. The decline in quicksilver to 40 c. and 50 c., gold, at San Francisco this year has enabled silver mines, even of the poorer class, to push their industry with the utmost vigour, and the year bids fair to prove the most bountiful one in the amount of gold and silver which add to the wealth of the United States. The production of the Western Slope of the Rocky Mountains for the current year is estimated by competent judges at the following rate per day:—

	Silver.	Gold.
Nevada	$125,000	$ 75,000
California	—	78,330
Utah	15,000	8,000
Oregon, Arizona, Montana, and Idaho	12,000	11,000
Colorado	15,000	10,000
Total	$167,000	$182,330
300 days	$50,100,000	$54,699,000

Constituting a total output of the precious metals of together some $105,000,000.

The five leading quicksilver mines of this country produced 39,542 flasks of quicksilver in 1875, as follows:—

	Flasks
New Almaden	14,000
New Idria	8,600
Redington	8,080
Sulphur Bank	5,215
Great Western	5,647
Total	39,542

The following proves to have been the world's production in 1875:—

	Flasks
California	53,700
Spain	36,000
Idria (Austria)	8,000
Germany (Palatinate, &c.)	2,400
Italy	2,700
Borneo	2,000
Mexico	900
Total	105,700

California's production during 10 years:—

	Flasks		Flasks	
1866	46,550	1871	Flasks	31,881
1867	37,000	1872		30,306
1868	37,000	1873		28,600
1869	33,713	1874		34,254
1870	29,546	1875		53,706

California's export by sea for the first six months of 1875 and 1876 has been as follows:—

To	1875. Flasks.	1875. Value.	1876. Flasks.	1876. Value.
New York	12	$ 1,423	1,975	$ 87,456
Mexico	2605	202,050	2,924	131,714
Chili	355	24,803	400	17,611
New Zealand	25	1,398	208	9,310
China	4863	301,639	11,303	493,513
Japan	306	21,845	206	9,181
Central America	4	200	117	5,086
British Columbia	10	526	4	180
England	100	7,650	—	—
South America	1020	95,516	857	37,336
Australia	352	21,959	473	20,925
Calcutta	10	450	—	—
Russian Asia	3	195	—	—
Totals	9665	$680,764	18,427	$812,312

The export in July was but 2128 flasks, against 3197 in 1875, China during the month taking 2000 flasks less.

ACTUAL RECEIPTS AT SAN FRANCISCO.

Jan. 1 to July 31.	1875. Bay.	1875. Coast.	1876. Bay.	1876. Coast.
January	1505	2	3877	281
February	3284	309	3864	62
March	3779	465	3732	154
April	3718	100	4313	317
May	3298	303	4954	304
June	3776	320	5368	362
July	4229	428	4510	383
Total	23,689	1927	30,648	1863

It will be seen that the export has nearly doubled, and that China has in proportion taken considerably more than it drew from California last year during the corresponding period. If during the latter half of the current year California keeps the same proportion of increase, and the remaining countries do not diminish their output, it seems evident that some 10,000 to 20,000 flasks will be added to the world's supply in 1876. Consumption, on the other hand, has no doubt vastly increased throughout the universe, especially in China, whose capabilities of absorbing for the manufacture of vermillion, &c., are evidently much greater at a moderate cost of the raw material than the world had any idea of. Yet the increase of production has been going on at such a rapid rate that consumption seems to be considerably exceeded; hence the precipitate decline that has been witnessed in London, where the metal, which less than two years ago was worth from 21. to 25. per flask, lately fluctuated between 7l. and 9l.

Although the house of Rothschild has retained its control of the great Peninsular Mine the increase of production in California has removed the centre of interest in quicksilver from London to the shores of the Pacific, where we have, at the same time, the bulk of production and of consumption.

The great impulse given to quicksilver production in California has subserved admirably the interests of mining the world over, and we trust that in the present value of the metal enough profit may be left the producers to enable them to go on at the present rate of output, and that they may not be compelled to curtail the latter. As early as January of the present year they ventured gloomy predictions as to the future of the quicksilver interest; but the subsequent increase of output proves that it pays them to continue, and as long as this impression prevails it is not likely prices will materially recover, unless it could be demonstrated that consumption has again caught up with production.—*Iron Age* (New York).

STEEL MINING CABLE.—The new steel wire cable, just received by the Savage Mining Company, is one of the finest ever brought to the Comstock. It was made by the Hazard Manufacturing Company, of Wilkesbarre, Pennsylvania, and is 2¼ in. in diameter, and 4000 ft. long; it is not a tapering rope, but is of uniform diameter throughout: it is round, and is composed of 343 small steel wires, so completely twisted and laid in together as to form almost a solid mass of iron. The weight of the cable is 36,000 lbs.: the wires of which it is composed, if stretched out in a single line, would extend a distance of 364 miles, and the strands (small bunches of twisted wire) of which it is made up would reach a distance of 52 miles.—*Enterprise* (Nevada).

THE COPPER TRADE.

The price of Chili bars fell from 72*l.* to 70*l.*, at which large purchases were made, and values again advanced to 71*l.* 10*s.* For Australian there was an improved demand, and Wallaroo proved scarce. On the 26th inst., 1566 tons of this description will be offered at public sale. Home consumers are bare of stock, which gives a steady demand for tough and best selected. We quote Chili bars 71*l.*, Wallaroo 77*l.*, tough 77*l.*, best selected 78*l.*, manufactured 83*l.*, ore and regulus 13*s.* 9*d.* to 14*s.* The imports and exports for seven months, January to July, were by the returns of the Board of Trade—

Imports.	1876.	1875.	1874.
Ore Tons	39,711	27,961	28,165
Regulus	17,875	20,169	18,738
Copper	22,437	26,083	25,224
Exports.			
Foreign raw	9,423	8,238	14,303
English raw	6,880	5,837	6,060
Manufactured, including yellow metal and brass	13,188	15,209	14,840

London, Sept. 7. FRENCH AND SMITH.

Apparently there is no stability in the price of this metal; it seems only to advance to fall again. There has been a range, both down and up of about 2*l.* per ton since the commencement of August, and now price is down again. There are next to no dealers in the article now that the importers of Chili copper, and more especially the producers of Australian, seem so determined to do business with consumers direct, forgetting the while how completely their interests are opposed. Sooner or later it will be recognised again that a dealer is a very useful person in the trade, and when this fact is arrived at there may be a future in copper. The coming sale of Wallaroo shows the index of its present condition. A public auction of 200 lots in 5 and 10 tons in a lot, is requisite to dispose of 1500 tons of a metal which some 12 months since was sold at the rate of 5000 tons in two private contracts. The statistical position of copper improved during the past month, but the trade is bad decidedly, and hand-to mouth buying only can be looked for. The Indian demand is a mere matter of Exchange upon which it is impossible to base any calculation, orders are in consequence scarce.

The imports of copper into England for the first seven months of the following years were—1872, 51,348 tons; 1873, 48,895 tons; 1874, 46,939 tons; 1875, 48,510 tons; 1876, 45,818 tons. The exports for the same periods were—1872, 24,361 tons; 1873, 32,545 tons; 1874, 34,332 tons; 1875, 27,542 tons; 1876, 28,658 tons. The position from Sept. 1, 1875, to Sept. 1, 1876, was as follows:—

	Price.	Stock on hand.	Stock, including afloat and chartered.
1875—September 1	£ 83 0 0	Tons 23,022	Tons 32,342
October 1	82 0 0	22,358	30,456
November 1	82 10 0	23,549	32,535
December 1	81 0 0	20,885	29,222
1876—January 1	81 10 0	20,583	28,978
February 1	81 0 0	20,302	27,843
March 1	76 0 0	21,963	30,217
April 1	77 0 0	20,734	30,982
May 1	79 10 0	21,169	31,988
June 1	78 0 0	22,632	30,997
July 1	74 0 0	24,834	31,431
August 1	72 0 0	25,596	31,803
September 1	72 0 0	24,417	30,548

And the comparative positions at the same date of the past four years with the present are as follow:—

	Price.	Stock on hand.	Stock, including afloat and chartered.
1872—September 1	£ 90 0 0	Tons 27,922	Tons 37,733
1873—September 1	84 0 0	29,983	37,321
1874—September 1	78 0 0	26,852	33,159
1875—September 1	83 0 0	23,022	32,342
1876—September 1	72 0 0	24,417	30,548

The West Coast charters to Aug. 15 were 27,500 tons, against 29,100 tons in the corresponding period of 1875. (The fortnightly charters to Aug. 31 are not yet cabled).—*Leadenhall-street, London, Sept. 7.* HENRY ROGERS, SONS, AND CO.

Messrs. JAMES and SHAKSPEARE—Stocks, September 1:—

Copper	England and France	Tons 24,855
Tin	England and Holland	9,728
Spelter	London, 70; outports, 813 =	883

THE TIN TRADE.

	July 31, 1876.	Aug. 31, 1876.	Aug. 31, 1875.	Aug. 31, 1874.
Straits and Australian, spot Tons	6,942	7,411	5,015 }	2,755
Ditto, landing	505	319	702 }	
Straits afloat	960	600	532	425
Australian, afloat	1,200	Est. 1,550	1,480	800
Banca, on warrants	1,640	775	385	330
Ditto, Trading Co.'s hands	1,264	1,706	2,659	4,460
Ditto, afloat	243	212	1,109	375
Billiton, spot	937	1,140	652	825
Ditto, afloat	800	1,000	1,000	375
Australian tin in Holland	—	795	—	—
Total Tons	13,891	15,508	13,564	10,345
Deliveries during the month in London	874	995	1,250	745
Ditto, Holland	663	872	777	790
Total Tons	1,537	1,867	2,027	1,535
Prices of Straits	£73 10s	£72	£83	£92 10s

Shipments from Straits, in August Tons 550
Ditto, Australia, ditto 450 (estimated)

	During 12 months ending Aug. 31, 1876.	During first 8 months, 1876.	During first 8 months, 1875.
Shipments from Straits to London Tons	7,180	4,740	4,640
Shipments from Australia to London	6,545	3,740	3,800
Deliveries of foreign tin in London	12,582	8,087	8,101

London, Sept. 1. A. STRAUSS AND CO.

No new feature presented itself in our market this month. There has been a good demand for consumption with but little variation in prices. Holders as a rule are most unwilling sellers. Looking at the statistical position of the article, it appears extremely doubtful whether their sanguine views will at all be realised. Banca after fetching 43¾ fl., and 43½ fl. in the beginning of the month declined to 43 fl., at which figure several transactions have been reported. A few hundred slabs might now find buyers at 43¼ fl., there being, however, no sellers below 43½ fl. Transactions in Billiton have been few, holders generally refusing to part with their tin: 42¾ fl. and 42½ fl. has occasionally been paid both for parcels on the spot and to arrive. Our present quotation is 42½ fl.: 10,000 peculs Billiton offered in public sale at Batavia Aug. 14 fetched the average price of 46·42 fl., costing to sell here about 43¼ fl. by steamer. Next sale, comprising the same quantity, will be held in October.

The position of Banca tin in Holland on Aug. 31, according to the official returns of the Dutch Trading Company, was—

	1876.	1875.	1874.
Import in August Slabs	17,469	8,726	20,294
Total eight months	72,690	55,913	113,289
Deliveries in August	18,300	16,39[illegible]	18,382
Total eight months	81,875	94,104	94,554
Stock second-hand	24,781	12,300	10,676
Unsold stock	57,927	84,728	142,679
Total stock	82,708	97,028	153,355
Afloat Peculs	3,400	19,050	2,430

Statement of Billiton:—

Import in August Slabs	17,400	5,500	5,856
Total eight months	71,479	56,202	53,156
Deliveries in August	9,467	5,993	7,975
Total eight months	64,477	60,445	51,920
Stock	36,681	27,363	26,456
Afloat Peculs	13,000	17,000	6,000
Quotation { Banca	43¼ fl.	52 fl.	57 fl.
Aug. 31 { Billiton	42½	49	54½

These combined returns of Banca and Billiton, compared with those for 1875, exhibit—An increase of the import for Aug. of 645 tons; an increase of the import for the eight months of 1002 tons; an increase of the deliveries for Aug. of 168 tons; a decrease of the deliveries for the eight months of 256 tons; an increase of the stock second hand of 681 tons; a decrease of the unsold stock of 837 tons; a decrease of the total stock of 156 tons; a decline of the quotation of Banca of 14*l.* 3*s.* per ton. The Government Returns for the month of June are as follows:—

EXPORT OF TIN FROM HOLLAND.

	June. 1876.	June. 1875.	June. 1874.	Six months. 1876.	Six months. 1875.	Six months. 1874.
Germany Tons	318	325	312	1632	2044	1727
England	19	52	74	29	333	217
Belgium	267	163	168	940	840	770
France	151	44	50	256	228	170
Hamburg	36	29	47	196	211	218
United States	—	33	—	17	33	16
Other countries	140	58	22	190	345	127
Total	931	707	673	3260	4034	3245

Rotterdam, Aug. 31. EBELING AND HAVELAAR.

A good business was done in this metal during the past month, both for speculation and consumption, the value of Straits and Australian ranging between 73*l.* and 71*l.* 10*s.* From the figures below it will be seen that the total supply of foreign tin has not increased during the first eight months of the present year, as compared with last, which is satisfactory, considering that the Tasmanian supply has been considerably developed in the meantime. The deliveries show an increase, but the figures 14,100 tons are inclusive of 790 tons Australian taken from this market and now stocked in Amsterdam: so that, deducting this amount, we have 13,310 tons to represent consumption, or about 400 tons for the eight months, less than last year, which is not surprising, owing to the depressed state of the tin-plate trade. Up to the present supply has exceeded demand, giving us an increased stock; but the shipments from the Straits are likely to receive a check by the advance in the exchange, by which the rates ruling in Penang and Singapore during the month would give a cost of 78*l.* per ton here. The dollar value has since been reduced equal to about 74*l.* laid down here; but to supply this market the price would have to fall to about $18—a value never heard of before, and one which would prove quite unremunerative, owing to the excessive royalty demanded by the native rajahs. A decreased production may, therefore, be looked for; and at the same time an increased demand for foreign, owing to the falling-off in English production, and a looked-for revival in the tin-plate trade, is a contingency not to be ignored. English was in fair demand. The Dutch Trading Company announce their next sale of Banca for the 26th inst., when 29,900 slabs will be offered. 10,000 peculs of Billiton, offered at public sale in Batavia, realised a price equal to about 43¾ fl. in Holland.

	1876. Aug. 1.	1876. Sept. 1.	1875. Sept. 1.	1874. Sept. 1.
Foreign in London, estimated at Tons	7,197	7,730	5,717	2,755
Banca in Holland, warrants	1,346	774	385	330
Billiton in Holland, ditto	898	1,146	855	825
Afloat for Europe, Straits, advised by mail and telegram	1,040	550	515	425
Afloat, Australian ditto	1,150	1,500	1,450	800
Afloat, Billiton	800	800	1,062	375
Banca in Trading Company's hands	1,264	1,810	2,649	4,460
Banca afloat, by sailing vessels	244	210	1,190	375
Total	13,939	14,520	13,823	10,345

Sept. 7. FRENCH AND SMITH.

THE COAL TRADE

Mr. J. R. Scott, the Registrar of the London Coal Market, has published the following statistics of imports and exports of coal into the port and district of London, by sea, railway, and canal, during August, 1876:—

IMPORTS.

By sea.	Ships.	Tons.
Newcastle	145	115,264
Seaham	29	15,041
Sunderland	93	64,295
Middlesborough	5	1,422
Hartlepool	90	30,395
Scotch	13	5,532
Welsh	4	1,538
Yorkshire	18	2,518
Small coal & cinders	18	2,888
Colonial	1	43
Total	416	238,933
Imports—Aug. 1875	425	235,153

By Railway and Canal.	Tons c.
London & North-Western	111,919 8
Great Northern	75,985 0
Great Western	67,980 0
Midland	114,754 0
Great Eastern	55,520 5
South-Western	4,828 12
London, Chatham, & Dover	1,585 0
South-Eastern	1,313 11
Grand Junction Canal	472 5
Total	434,358 1
Imports during Aug. 1875	410,708 14

Comparative Statement, 1875 and 1876.

By Sea. Ships.	Tons.	By Railway and Canal.	Tons.
Jan. 1 to Aug. 31, 1876 3650	2,083,142	Jan. 1 to Aug. 31, 1876	3,261,909
Jan. 1 to Aug. 31, 1875 3746	2,064,464	Jan. 1 to Aug. 31, 1875	3,204,775
Increase—present year —	23,678	Increase in the present year	57,134
Decrease—present year 96	—		

EXPORTS.

Railway-borne coal passing "in transitu" through district		Tons 66,566
Sea-borne coal exported to British possessions, or to foreign parts, or to the coast	47,924	
Ditto, sent beyond limits by railway	13,133	
Ditto, by canal and inland navigation	1,934 =	62,991
Railway borne coal exported to British possessions, or to foreign parts, or the coast	20,206	
Ditto, by rail beyond district	2,103	
Ditto, by canal and inland navigation	265 =	22,574
Sea-borne coal brought into port and exported in same ships		310
Total quantity of coal conveyed beyond limits of coal duty district during August, 1876		152,441
Ditto, August, 1875		134,023

Comparative Statement, 1875 and 1876.

Total distribution of coal from Jan. 1 to Aug. 31, 1876	1,246,449
Total distribution of coal from Jan. 1 to Aug. 31, 1875	1,151,860
Increase in the present year	94,589

General Statement, 1875 and 1876.

Increase in coals exported		94,589
Deduct increase in coals imported by sea during the present year	23,678	
Increase in ditto by railway	57,134 =	80,812
Total increase in trade within London district during present year		13,777

COPPER ORES.

Sampled Aug. 16, and sold at Tabb's Hotel, Redruth, Aug. 31.

Mines.	Tons.	Price.	Mines.	Tons.	Price.
West Seton	72	£6 7 6	East Pool	5	£7 12 6
ditto	71	4 11 0	South Crofty	54	2 9 0
ditto	68	4 8 0	ditto	45	2 4 0
ditto	67	5 2 6	ditto	36	3 9 0
ditto	50	4 8 6	ditto	34	3 1 6
ditto	44	3 12 6	West Basset	44	3 0 0
ditto	19	3 6 6	ditto	41	3 6 0
ditto	10	3 8 0	ditto	25	2 4 0
Crenver and Abraham	68	1 17 0	Carn Brea	56	3 1 6
ditto	63	2 12 6	ditto	39	3 3 6
ditto	56	3 6 6	St. Aubyn United	40	7 2 6
ditto	45	2 13 0	ditto	35	3 1 6
ditto	42	2 9 0	South Carn Brea	55	4 18 6
ditto	40	6 14 6	Carn Camborne	23	3 5 6
ditto	36	3 2 6	Condurrow	22	0 19 0
West Tolgus	74	5 0 0	Killifreth	22	3 16 0
ditto	60	5 4 0	New Rosewarne	9	10 17 6
ditto	56	3 15 6	ditto	5	3 11 6
ditto	50	5 10 6	ditto	4	2 9 6
East Pool	51	3 19 0	Wheal Comford	12	4 13 6
ditto	50	3 11 6	West Godolphin	8	20 0 0
ditto	40	3 0 0	West Gorland	2	3 10 0
ditto	33	4 7 6			

TOTAL PRODUCE.

West Seton	401	£1902 11 0	South Carn Brea	55	£ 270 17 6
Crenver & Abraham	350	1081 0 6	Carn Camborne	23	75 6 6
West Tolgus	240	1169 13 0	Condurrow	22	20 18 0
East Pool	179	682 14 0	Killifreth	22	83 12 0
South Crofty	169	460 1 0	New Rosewarne	18	125 13 0
West Basset	110	322 6 0	Wheal Comford	12	56 2 0
Carn Brea	95	296 0 6	West Godolphin	8	160 0 0
St. Aubyn United	75	392 12 6	West Gorland	2	7 0 0

Average standard £ 93 2 0 | Average produce 6⅞
Average price per ton £4 0 0
Quantity of ore 1781 | Quantity of fine copper 122 tons 7 cwts.
Amount of money £7106 7 6
LAST SALE.—Average standard £102 18 0 | Average produce 6⅛
Standard of corresponding sale last month, £ 93 3 0—Produce, 7⅜

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Names.	Tons.	Amount.
Vivian and Sons	333¼	£1588 17 4½
Grenfell and Son	283	1346 15 0
Nevill, Druce, and Co.	309	1159 10 0
Williams, Foster, and Co.	22	20 18 0
Mason and Elkington	333¼	1124 17 4½
Charles Lambert	365¼	1470 13 10½
Sweetland, Tuttle, and Co.	133¼	394 15 10½
Total	1781	£7106 7 6

NO SALE on Thursday last, Sept. 7, or Thursday week, Sept. 14.

STEAM BOILERS.—With a view to facilitate the rapid circulation of the water and to prevent to a great extent the formation of calcareous deposits in the boiler, Mr. N. ROSER, of Paris, proposes to place in the boiler two or more serpentine or helical tubes. In carrying out the invention the body of the boiler or generator is constructed in the ordinary manner with inner and outer shells suitably connected together and provided with grate bars and door, and the requisite valves and pipes and gauges, the space between the two shells serving as a water space or jacket. Openings are made in the inner shell near the bottom and in the dome to receive the ends of a serpentine or helical tube, and inside the helice the helice is placed a second and smaller serpentine or helical tube, the ends of which are connected to the first near the ends. In order to distribute the flame and gases equally over and around the serpentine tubes a double bridge or deflector is placed in the upper part of the internal dome and just below the chimney stack. Above the outlet in the dome of the serpentine pipe is placed an angle piece, which is intended to receive the shock of the water and steam issuing from the pipe. The feed water is supplied to the water space or jacket, whence it flows into the serpentine tubes which are thus always kept full. By constructing a steam boiler or generator in this manner a rapid and complete circulation of the water will result, and the liability to explode is materially lessened, while a greater vaporising surface is obtained.

SHARPENING SAWS.—For the purpose of sharpening a saw, according to the invention of Mr. W. L. COVEL, of Providence, U.S., it is supported, with capability of adjustment, in mechanism acted upon by suitable connections to carry the saw tooth by tooth up to or past the sharpening wheel or cutter. The sharpening wheel or cutter is mounted upon an axis which, by means of a strap or band, receives rotary motion from the main or driving shaft. The sharpening wheel or cutter is preferably formed of emery, or has an emery cutting edge applied thereto, and the axis of this wheel is mounted at one end in a segmental piece to enable the wheel to be adjusted readily to the different angles required for the saw teeth, the centre of the wheel being that from which the segment is struck. On an axis receiving rotary motion by means of gearing from the main shaft is fixed a crank, which is connected to a lever which operates the saw to raise it up to the cutting wheel, and lower it down therefrom as each tooth is being sharpened, and he fixes on such secondary shaft a cam or former shaped according to the shape of tooth he desires to act up or sharpen. The cam or former is adjustable on its axis, and acts upon a lever mounted upon an axis, which by means of suitable levers and connections gives the necessary motion to a lever

to carry the saw in the direction desired, and at the same time by means of a "dog" acting upon the saw teeth feeds the saw forward tooth by tooth, so that as the saw rises to the emery wheel the front of the tooth is acted upon, and as it recedes it is racked by the feed dog, so as to cause the emery wheel to pass up the back of the next tooth.

Meetings of Public Companies.

CARDIFF AND SWANSEA SMOKELESS STEAM COAL COMPANY.

An extraordinary general meeting of the shareholders of the above company was held on Tuesday last at the City Terminus Hotel—Colonel SHAKSPEAR in the chair—for the purpose of confirming certain important resolutions passed at the special general meeting held on August 18 last.

Mr. JOHN DAVIES (secretary) read the notice calling the meeting.

The following are the resolutions submitted for confirmation:—

That an indenture made August 10, 1876, between Thomas Cory and Frank Ash Yeo of the first part, John Cory and Richard Cory the younger of the second part, and the company of the third part, which has been executed for the settlement of difference between the said Thomas Cory and Frank Ash Yeo, John Cory and Richard Cory the younger (the vendors to the company), and the company, be confirmed, and that the directors be authorised to take all such steps as may be necessary or proper to carry into effect the provisions of the said indenture.

That in accordance with the provisions of the said indenture, the 3855 unallotted shares of 10*l.* each of the company be allotted to the vendors as paid-up shares in exchange for debentures of the like nominal amount now held by them.

That in accordance with the provisions of the said indenture, the 22,819 ordinary shares of the company already allotted, and the said 3855 shares to be allotted aforesaid, be converted into preference shares, with a preferred dividend of 5 per cent. per annum, payable out of the profits of each particular year, without any right to arrears in case of insufficiency of such profits in any year; and that the 13,326 existing vendors' paid-up shares be entitled to a deferred dividend of 5 per cent. per annum, payable out of the profits of each particular year after the payment of the aforesaid dividend, and also without any right to arrears in case of insufficiency of such profits in any year; and that the residue of the profits of the company in each year be distributed rateably among all the shareholders, provided that the power of the directors under No. 102 of the Articles of Association shall not be hereby affected. But, that if in any year, by reason of any sum being carried to the reserved fund, it shall be impossible to pay in full the said preferred and deferred dividends earned in that year, or either of them, then so much thereof respectively as shall so remain unpaid shall all be paid out of the net profits of subsequent years next, after the said or deferred dividends respectively, which shall be earned in those years.

And that in accordance with the provisions of the said indenture the remaining debentures now held by the vendors be exchanged for debentures payable in three equal portions at the end of 10, 15, and 20 years, from June 11, 1875, together with interest thereon from such date at the rate of 6 per cent. per annum, payable half-yearly.

The CHAIRMAN said that on many previous occasions he had addressed the shareholders at great length, but to-day he had very little to say, as the resolutions they had met to confirm had already been fully discussed. He would simply move that the notice be received.

The resolution was seconded and carried unanimously.

The CHAIRMAN then formally moved the confirmation of the modified agreement which had been submitted to the shareholders.

Dr. SHARP seconded the resolution, which was put and carried.

The CHAIRMAN: I do not suppose any shareholder wishes the agreement to be read. You must leave that in the hands of the solicitor; it is here if anyone wants it read, but it simply embodies in strict legal form what the shareholders wish to be carried out Gentlemen, I believe a long and arduous discussion has now terminated, and I hope for the benefit of the company.

The meeting then broke up.

WHEAL GRENVILLE MINING COMPANY.

The three-monthly general meeting of shareholders was held yesterday at the offices of the company, St. Andrew's House, Changealley, Cornhill, Mr. F. G. LANE in the chair.

The CHAIRMAN: I am sorry to say, gentlemen, that your Chairman is not here; he is travelling about, but takes none the less interest in your concern. Whenever in town he calls here and sees how things are going on, and while away he has all reports and accounts forwarded to him. It is unfortunate he is not with us to-day, but we hope that his health is being benefited by his absence.

Mr. T. B. LAWS (the secretary) read the notice convening the meeting, and the minutes of the last general meeting, which were then confirmed as correct.

The SECRETARY stated that since the last meeting 11 shares had been written off to the forfeited share account.

The CHAIRMAN: The next business is the reading of the minutes of the committee meeting, but as they are very voluminous I would suggest that you take them as read. The only matter of any moment in them is this—complaints have been made with regard to the management of the mine, but on enquiry we found that these complaints have been made to the secretary by merchants, and on communicating with Capt. Hodge, we were satisfied that he was doing his best in getting materials from the cheapest market, and therefore we passed this resolution—"Resolved: With regard to the parties from whom supplies for the mine are to be obtained, that this be left in the hands of Capt. Hodge, who will, we trust, do the best for the interests of the adventurers."

Mr. DOWLING: Of what did they complain?

The CHAIRMAN: Some shareholders and others wanted the company to have its supplies from them, and also another gentleman, member of a highly respectable firm of merchants, wrote and complained of the management because (as we found out afterwards) large orders were not given to them. We deemed it the best and most prudent cours to leave these matters entirely in the hands of Capt. Hodge, provided, of course, his administration of affairs was calculated to preserve and promote the best interests of the adventurers, and always with the understanding that shareholders should have the preference, provided that they offer the best and cheapest material. (Hear, hear.) The next matter on the minutes of the committee, a very important one, was brought before your notice casually at the last meeting. A letter has been received from Messrs. Childs and Batten, acting on behalf of Mr. John Watson, claiming an amount due to East Wheal Grenville of 84*l.* 8s. 11d., said to be for pumps, &c., supplied to the Wheal Grenville Mine, in August, 1873. Now, your committee could not find by the books or by any papers in their possession that there is anything due to the East Wheal Grenville Mine, and so we passed this resolution: "That Messrs. Childs and Batten be informed, in reply to their letter of Aug. 8, that Mr. John Watson, the late secretary, intimated to the company that all bills had been charged and entered in the accounts presented to the shareholders at the meeting held on Oct. 8, 1875, and all previous meetings; and that as there is no entry in any books of the mine handed over to the present secretary of any materials having been supplied by the East Wheal Grenville, further than those already paid for, that such claim will be resisted." In asking you now, gentleman, to confirm the minutes of the committee, we we ask you to confirm their action in this respect. Those are the chief points. If you think we were justified in resisting the claim you will confirm our proceedings, if not you will negative our policy.

Mr. KENEAR: I think you were quite justified in resisting the claim.

Several SHAREHOLDERS: Certainly. I think we cannot do better than leave the matter in the hands of the committee.

The CHAIRMAN: I may assure you, gentlemen, that we wish to act as prudently as possible in this matter, and to do nothing that may injure the interests of the shareholders.

Subsequently was passed the following resolution—"Captain Hodge having stated that he has heard that there has been in times passed material, &c., lent by East Wheal Grenville to Wheal Grenville, and *vice versa*, there are other matters concerning the two mines which also require investigation, and, therefore, suggest that all matters in dispute should be left to arbitration."

A resolution was then passed confirming as correct the minutes of the committee.

The SECRETARY stated that the cost-sheets, merchants' bills, and vouchers of all payments were on the table for inspection. The statement of accounts was taken as read.

The CHAIRMAN: Gentleman, I am not desirous to rake up old grievances—In fact, I would rather that they should be forgotten; but certain statements had been made in the *Mining Journal* which are, I was going to say, almost beneath my notice; but still, in the interests of the shareholders, and for our own justification, I should just refer to them very briefly, and give you one or two facts which will very effectually contradict the impressions those statements seek to convey. I believe I shall prove my case best by drawing a comparison between the workings of the mine during the management of the present committee and those during a similar period last year. Now, it is stated here, among other things, that "the result of the change of management in Wheal Grenville has been, so far, the reverse of satisfactory." On seeing this, I communicated with the Editor of the *Mining Journal*, and he kindly wrote me: "He felt compelled at times to insert letters to satisfy others that he was not an interested party." So that clearly these letters are not worthy of notice. I will now call your attention to one or two facts, in order to show you that in making the changes in the management we have acted for the material benefit of the shareholders. I will institute a comparison between the results of this year and 1875, and to do so I will take the accounts presented by the late management, not from the books, but from the published statements. In the seven months from February to August, 1875, the loss was 45*l.* per month; while the costs were 741*l.*, or about 106*l.* per month. The returns for the same period amounted to 423*l.*, or about 60*l.* per month, showing a total loss for the seven months of 318*l.*, or about 45*l.* per month. Now, gentlemen, these figures cannot be controverted, because they are here in print. At that time, taking the accounts of the first four months—February, March, April, and May—of 1875, the average price obtained for the tin was 54*l.* per ton. During June, July, and August the average price was 52*l.* per ton. Thus these accounts will show a return of 60*l.* per month against a cost of 106*l.* Now, during the past six months, while the present committee have had the management, the costs have been 534*l.*, and the returns 364*l.*, showing a loss for the whole period of 169*l.*, or 28*l.* per month. If the tin sold during the first three months—February, March, and April—this year had been sold during the corresponding period last year the mine would have realised 400*l.*, or a little over 100*l.* a month, more than it actually did. Had this been the case our loss would have been reduced to something like 172*l.* If the tin sold in May, June, and July this year had been sold at last year's prices for the same period, we should have received 7*l.* per ton more, or a difference in the aggregate of a sum of 250*l.* Well, gentlemen, our loss, as I have stated, is only about 28*l.* per month for the past half-year, while if we had obtained the prices realised last year the loss would have stood at 172*l.*, against a loss of 455*l.* in the previous twelve months. It is for you to say after hearing those facts whether the present management has effected the object intended—to reduce the costs. I stated to you that I felt confident that with a change in the management the costs could be reduced and the returns increased. (Hear, hear.) Now we will refer to the returns. The returns from February to August, 1875, were 423*l.*, or about 60*l.* per month, while the returns of the six months of this year (we cannot take seven, as the accounts are not rendered) are 359*l.*, or about 60*l.* a month. But it is to be borne in mind while considering these figures that if we had sold the same quantity of tin at the same price as last year we should have realised 60*l.* more than now appears, and our loss would have been trifling. The debt upon the mine when the new management took office was extremely large. That has been met by the very liberal manner in which the shareholders have come forward with contributions; they have also most generously advanced the money requisite to work the mine. (Hear, hear.) Now, gentlemen, our position is this—we cannot continue working except at a loss, at the same time the loss at present is nothing compared to what it was previously. In conclusion, I have only to observe that we have not had Captain Hodge here to justify his conduct or to refute any statements which have been made respecting him. I should be ashamed to attempt a defence, these figures being so plain. But we have asked him to attend here to-day in order that he may answer any questions you desire to put respecting the working of the mine. I shall now move, "That the accounts as presented to you be allowed and passed."

Mr. KENNEAR seconded the proposition. This was then put to the meeting, and carried unanimously.

The SECRETARY read Capt. Hodge's report.

The CHAIRMAN: That, gentleman, is the agent's report, and if you desire to ask Capt. Hodge any questions thereon he will be pleased to answer you. We have another report which the committee thought in the interests of the adventurers we had better have drawn up for your satisfaction, and that is from the engineers. From that you will see that, independent of our usual monthly costs, we have laid out a cosiderable sum for the repair of the machinery, which is now getting into as perfect a state as possible.

Capt. HODGE: We have expended about 40*l.* under this head.—The SECRETARY read the engineers' report.—The CHAIRMAN: As far as your committee can see this is a true and faithful account of the state of affairs.—A SHAREHOLDER: Will you have it printed?—The CHAIRMAN: The committee are willing to have it printed if it be the wish of the meeting.—A resolution was passed authorising the printing of the two reports.

Capt. HODGE, replying to a question as to the prospects of the mine, said that if there were another 10*l.* rise in the price of tin, and their machinery were put in anything like order, the mine would do very well.

A SHAREHOLDER: What do you mean by "anything like order," is it so greatly out of repair?—Capt. HODGE: Well, the machinery is not sufficiently strong to cope with the water.

The CHAIRMAN: Do you consider you are opening up as much ground as you have taken away?—Capt. HODGE: Certainly I do.

The CHAIRMAN: Have the ends of the lode improved?—Capt. HODGE: They vary a good deal. We believe that the lode will improve when we get lower.

The CHAIRMAN: Well, gentlemen, it is very evident that we cannot carry on the works of this mine with tin at its present price without a loss. The question, therefore, for you to consider is what is to be done under the circumstances. I need not remind you that of all enterprises mining is the most uncertain. Accidents of all kinds may happen, or circumstances quite unforeseen and totally beyond control may occur and upset all your calculations. At the same time I must say that Capt. Hodge has been very correct in his estimates hitherto, and we have not made a greater loss than he led us to believe, taking into account a few unforeseen circumstances. The captain informs us that the old lode from which such great amounts of ore has been extracted hitherto has fallen off very considerably. We knew that before the change in the management took place, but Capt. Hodge assures us he improvements on the great lode have fully compensated for that loss.

Capt. HODGE: Had the old lode continued to yield as before we should have made no loss this last half-year.

The CHAIRMAN: We are now in this position—our assets are actually at the present time more than our liabilities. Our assets represent about 78*l.*, and our liabilities about 74*l.*

The SECRETARY: We have money enough to meet all our liabilities at the present moment.

The CHAIRMAN: Yes, gentlemen, you have enough money in hand and coming in to meet all that is owing by you, including the old balance. But we must provide before we separate to-day for the next three months loss. To do that a call must be made. Of the arrears stated in the accounts about 100*l.* has been received, and probably in a few days the remainder may be sent in. Your committee think it will not do to go back, and would, therefore, propose that a call be made. Your company financially stands as high as any in Cornwall; indeed, there is no mine whose accounts are paid up so close of ours are. We have got into this satisfactory position, and the committee do not wish to go back. It is for you to say whether you will provide us with the money. The committee would suggest that a call of 3s. per share be made. That would provide for all possible costs, while if the price of tin advances or the condition of the mine improves nothing like that sum would be used. We have reason to be sanguine in regard to both those prospects. Should the price of tin improve we could work several other points in the mine which cannot at present be worked except at a loss.

A SHAREHOLDER: With regard to additional machinery?—The CHAIRMAN: The committee had considered the matter more than once, and whether it was advisable to counsel you to erect further pumping and stamping power; but we have come to the conclusion that it is better to go on as we are for the present, having regard to the low price of tin. There is no doubt we could do better if we had improved machinery, but we do not see our way clear to advise that additional outlay just now. It would involve an additional expenditure of some thousands, about 500*l.* The committe would not recommend you to attempt that at present; and you may rest assured that before any effort was made to raise the money, a special meeting would be called to discuss it with the shareholders. Well, gentlemen, I beg to propose, "That a call of 3s. per share be now made, and that a discount of 5 per cent. be allowed if paid before Oct. 2."—Mr. DOWLING seconded the resolution, which was then put and unanimously carried.

A resolution was also passed to the effect that, a special general meeting be held just prior to the next general meeting for the purpose of declaring absolutely forfeited all shares upon which calls now unpaid be then due.

The CHAIRMAN felt that they should not separate without passing a cordial vote of thanks to Capt. Hodge for the satisfactory manner in which he had conducted the working of the mine. Personally, he reposed the utmost confidence in their manager; at the same time, if he should by any act of his render himself unworthy of that confidence, it would be immediately withdrawn. He knew no such thing as favouritism in business matters, and in this case he regarded but the interest of the company, and that alone. He could positively affirm from what he knew of the affairs of the company that Capt. Hodge scrupulously observed the interests of the adventurers, and for that reason he (the Chairman) deemed him entitled to their thanks. (Hear, hear.)

Mr. KENNEAR seconded the proposition, which was accorded unanimously.

Capt. HODGE having acknowledged the compliment, a vote of thanks was passed to the committee of management, and the proceedings closed.

KILLIFRETH MINING COMPANY.

A four-monthly meeting of adventurers was held on Tuesday at the mine. Mr. J. TREGONING, the purser, presided, and there was a large attendance of shareholders. The accounts showed that the total liabilities, including 1765*l.* 2s. 8d. brought forward from the last account, 1467*l.* 15s. labour costs, 504*l.* 3s. 10d. merchants' bills, and 409*l.* charged on account of the new stamps, amounted to 4305*l.* 18s. 5d. The credits were 900*l.*, call made at the last meeting; 79*l.* 12s. 2d. for tin; copper, 7*l.* 10s. 10d.; and extra carriage, 3*l.* 2s. 10d. In addition to this the Chairman explained that they had credited 500*l.* for tin in stock, and he believed he was quite safe in saying, on the authority of the agents, that that was only about 50 per cent. of the tin which they had broken. They did not admire the principle of crediting tin on account, but under all the circumstances he thought they were quite justified in doing it on this occasion. The cost of the new engine, to the extent of 409*l.* had been charged in the present accounts, and the balance now against the mine was 247*l.* 12s. 7d. He was glad to say that everything had been charged up as close as possible, and in this respect they compared favourably with any mine in the county.

In answer to a question from Mr. Michell, of St. Day, Capt. GOOCH, manager of the mine, said he did not believe that every necessary expense in connection with the purchase of the stamps, engine, &c., and the erection of the requisite buildings, would exceed 200*l.* He should not hesitate to take a contract for it at that price.

The agents say in their report—"We have purchased a 32-inch cylinder stamping engine, also two 16-head stamp axles, with 32 heads of stamps, frames, and horses complete, including five round buddles with gearing to work the same, for the sum of 567*l.* 10s. Good progress is being made in the buildings for the stamping engine-house, and the laying out of the dressing floors, &c., and when the stamps are completed and in full working order we expect to be in a position to make profitable returns. Looking at all the points of operation, and especially the lode at the bottom of the engine shaft, we consider our prospects to be good for opening up a lasting and profitable mine." The CHAIRMAN said it was about the best report it had ever been his pleasure to read. The various points in the mine, independently of the pitches, were worth something like 80*l.* per fathom.

The question of the call led to some discussion, Mr. JACOBS, of Falmouth, thought a 4s. call would be sufficient, but the PURSER suggested that the balance against them warranted a larger call being made, and it was eventually decided to make a 5s. call.

In answer to a question from Capt. Abraham James, the PURSER stated that they were at present paying 1-20th dues.—Capt. JAMES suggested that a deputation should be appointed to wait upon Viscount Falmouth to ask for a reduction of the dues, but the PURSER said a similar application had been made before without any satisfactory result.

Capt. JAMES: I think this is a fitting occasion to call attention to the dues that are paid by other mines in the district, in order that the adventurers may see the heavy burden that is imposed upon this mine. At Cook's Kitchen they are paying 1-60th; West Frances, 1-30th; South Frances, 1-30th; South Crofty, 1-60th on a fourth, and 1-48th on three-fourths; Carn Brea, 1-48th: Wheal Basset, 1-60th; West Basset, 1-30th; Unity Wood, 1-24th; West Tolgus, a mine which, perhaps, is paying a larger dividend than any other mine in the county of Cornwall, 1-48th; and Tincroft, the recognised richest mine in the district, 1-24th. And yet in this little mine, where we have such uphill work to pay so much cost, and to erect machinery at such great expense out of our own pockets, we are compelled to pay 1-20th dues. But that is not all: our engine-house, as I understand, will cost us something like 300*l.*, but if Viscount Falmouth had been a liberal lord he would have given us the privilege of putting a new engine in the house on the borders of our sett, and thus have saved to the company the expense to which they will now be put; and I think it is our bounden duty not only to ask for a reduction of the dues, but to declare our sentiments with regard to the engine-house which we have on the borders of our sett, but are not allowed to use. It is clear that until our machinery is erected we shall have to continue paying calls out of our own pockets. If we had been paying dues out of profits probably we should not have so much to say upon the matter, but seeing that we are paying them on the gross returns, I do think that we have just cause to complain, and that it is our duty to use every proper means to get a reduction of those dues.

The Rev. G. L. CHURCH said he agreed with all that had fallen from Capt. James, with the exception of his reference to the question of the engine-house; that matter was now settled, and he feared if re-opened in the way suggested it would weaken the claim which they had upon Lord Falmouth for a reduction of the dues.

Capt. JAMES: I have inspected this mine, and I can truly say that I do not know its equal in this district, and touching on another point, I am thoroughly convinced that had we been allowed to sell our tin in the stone as other mines have done and are doing now, we should not have had to make a call to-day. On the contrary, the mine would have been self-supporting in every sense of the word, and we should probably have made enough profit to pay for all the machinery that we are now obliged to erect. It most illiberal that we should have to pay 3d. per ton upon the tin that we sell in the stone, and that a limit should be put on the quantity so sold. It is a restriction that was never heard of before, and a stumbling block which, in the interests of mining, ought to be removed. I believe that if the actual facts are fairly, fully, and firmly represented to Lord Falmouth he will be disposed to meet us in a different spirit than at present.—Capt. GOUGH thought that at any rate Lord Falmouth could hardly refuse to reduce the dues while the adventurers were incurring their present heavy outlay in machinery and buildings.—Although a strong desire was expressed that an application should be made to the lord to reduce the dues, it was generally considered to be useless to pass any resolution to that effect, as the application was certain not to be granted, and so the matter dropped without any determination being come to, and the meeting separated.

NORTH TRESKERBY MINING COMPANY.

A meeting of adventurers was held on Tuesday, at the mine, Mr. H. L. PHILLIPS presiding, when the accounts showed a balance against the mine at the present time of 809*l.* 14s. 11d.—The CHAIRMAN mentioned that there were arrears of calls amounting to 1263*l.* 5s., and that there was a sum of 900*l.* due on relinquished and forfeited shares. In answer to a question from Mr. ARNOLD, the CHAIRMAN said he should think the bulk of the arrears was good.—Mr. ARNOLD was of opinion that the mine being under the Cost-Book system it was not right that they should have such a large debit balance hanging over their heads. They were now owing 2000*l.* to their bankers.—The CHAIRMAN explained that this was entirely owing to the calls not having been paid up.

Mr. WHITWORTH suggested that, looking at the present position of affairs, it was desirable that a committee should be appointed to take the position of the mine into consideration, giving them the power at the same time to stop or continue the working of the mine as they might think best. He moved a resolution to that effect, together with the passing of the accounts, and the making of a call of 2s. 6d. per share.—This was seconded and carried, the committee to consist of Capt. R. Pryor, the manager; Mr. Phillips, Mr. Arnold, and Mr. Tregoning, to whom power is given to call the next meeting of the shareholders at any time they might deem advisable, in order to consider the future working of the mine.

The CHAIRMAN mentioned that 332 shares in the mine were held by persons out of the county. He did not believe tin was going any lower, nor could he think that matters had come to such a crisis in the county that Cornish mining could not be carried on any longer.

In reply to Mr. WHITWORTH, who said it was his opinion that the north part of the mine would pay for tin, Capt. PRYOR said that part was under water. He never saw a better looking lode than there was there, but it was only for a few days in the summer that that the course of tin could be seen. In wet weather it was hidden from sight by the water. The lode was 40 ft. wide, and there were only two two things which they had to do, either to drive a deep adit cross-cut, or to put up one of Tangye's patent pumps to pump out the water. This would cost about 100*l.*, including the pitwork.

Capt. MARTYN stated that he had seen scores of tin mines, but he had never seen such a tin lode as the one in the north part of this sett.

It was further stated that the lode in question was 10 fms. long, and worth about 35*l.* per fathom, and Capt. Josiah Richards, the other agent of the mine, says it is in a position now to pay costs, and that but for untoward circumstances nearly 5 tons of tin more would have been returned and included in the present accounts. The lode is said to surpass any other tin lode in the county, and all that is wanted is a better price and more thorough means for developing the mine.

— *Western Daily Mercury.*

[For remainder of Meetings see to-day's Journal.]

MINING ENTERPRISE IN CHILI.

We have been favoured by Mr. Henry Sewell with an interesting account with reference to the Quimby expedition to the Chilian gold fields. It appears that Mr. W. C. Quimby, for some time a leading reporter on the New York Herald, migrated in 1875 to the Pacific Slope, and speedily obtained the appointment of United States Commissioner to the Chilian Exposition. His urbanity and attractiveness soon procured him a powerful connection, and he became the particular friend of a wealthy Chilian, whose estate—the Hacienda Catapilco—36 miles north of Valparaiso, comprised upwards of 12,000 acres, not of arable land, but of hillocks, hills, and mountains, with a gold mine here and there. These mines (if mines they could be called) were very old, having been worked for years by natives, whose method of placer mining was primitive, to say the least. Away up among the hills near the limits of the hacienda Catapilco was an artificial lake, from which the Catapilco creek meandered down among the hills, through the estate, and into the ocean. This creek constituted the only water-power for washing out the gold, and, as many of the diggings were far up among the hills, natives laboured under a serious disadvantage. After they had got a bushel or more of dirt from their diminutive mine they would convey it in leathern pouches or bags to the creek, where they would wash it in rockers. This was the surface dirt, scraped up from the ground, and panned out from 10 to 20 cents per cubic yard, according to the locality. If a native miner makes four bits a day with his antiquated and only method of mining he considers it a good day's work. The holes dug by the native miners on the hacienda Catapilco are as thick as squirrel holes on a Californian ranch, and not much larger, but millions of cubic yards of dirt, as yet unwashed, may be seen in little mounds like gopher heaps all over the hacienda Catapilco.

The Chilians sink but few shafts, and when, in a streak of energy, they do sink a shaft they go at it in a way refreshing to the beholder. All of their shafts are at an angle, and a flight of steps is cut out of the soil, thereby enabling them to walk up and down. These shafts are sunk until the bed-rock is reached. Here they send out drifts radiating from the shaft. Each miner goes down to the bottom of the shaft with his leathern pouch suspended from his shoulders. He fills his pouch with dirt, clabers up out of the shaft, rambles down to the creek, washes out his dirt, stows away his 10 cents worth of gold in his hair, or his ear, or between his toes, and saunters back for more dirt. He works his shaft until an earthquake comes along. Then he climbs out of his shaft considerably agitated, and surveys the prospect. The earthquake dampens his ardour, and quenches his ambition. Down into that shaft he will never go again, however massive may be the nuggets obtainable. He generally allows several years to elapse ere he sinks another shaft, and sometimes he never renews the attempt in that locality.

Besides these shafts and diggings, gold in considerable quantities has been found in the bed-rock of the Catapilco creek, which traverses the hacienda Catapilco; owing to the want of the necessary machinery the creek has not been thoroughly worked. Specimens of the Catapilco gold were taken by Mr. Quimby to San Francisco, and a company was formed with a capital of $1,000,000, and 15 of the 50 claims were adopted. The principal capitalist in the concern is Dr. J. P. Burns, of Baltimore. The assistant assayer of the San Francisco Mint accompanies the expedition ostensibly as a stockholder, but it is a significant fact that he has obtained four months leave of absence, and received a months salary in advance. The party will immediately embark in placer mining, under the supervision of a practical miner, and will also follow up the alleged rich bed-rock of the Catapilco creek. It appears that no machinery has ever been employed by the Chilians in their gold mining operations, although they have been extensively carried on in some districts in the country. These mining operations were, of course, of a very primitive character, all the work having been done with a small bar, a large leathern bag, and a rude pan. Mr. Quimby's attention was called to the placers at Catapilco by the owner of the hacienda. He visited the territory, which has been burrowed by the peon miners like a rabbit warren, and, although without previous experience in gold mining, conducted some explorations on his own account. The explorations ended in his obtaining control of some 51 mining claims at Catapilco, the owner of the hacienda to receive a tithe of the product of the mines for the water rights. When Mr. Quimby arrived here he brought with him a few ounces of the gold washed from his claims.

The gold is of a very bright colour, rather scaly and rough, but, without coarse. On his way up from Valparaiso Mr. Quimby made arrangements with Dr. Burns, the head of the party which has now been organised. The result of the expedition will be awaited with interest. Mr. Quimby says the gravel deposit in which the gold is found is from 18 to 145 ft. in thickness on the hills, and the gold is distributed throughout it from the sod to the bed-rock. The gulches have not yet been prospected. Only one shaft was ever sunk in the creek, but the peons having no pumps they were beaten out by water. Bed-rock was reached in that shaft at a depth of 34 ft., and coarse gold in considerable quantities on it. Mr. Quimby is not over sanguine, nor does he place extraordinary faith in the richness of these placers, as his efforts are more particularly devoted to the cultivation of trade between Chili and certain business houses in this city, which he represented at the Chilian Exposition.

INVESTMENT CIRCULAR AND FINANCIAL RECORD.—The September edition of Messrs. Archard Jones and Co.'s Circular contains observations well worthy of the careful attention of capitalists. A review of the money market generally is followed by a concise report of the London Mining Share Market, embodying their opinion upon the desirability or otherwise of purchasing any of the shares which are at present receiving the most attention on the market. They do not recommend foreign mines of any description, and have some very appropriate remarks on the unnecessary risks which capitalists run in connecting themselves with American and Australian enterprises. They point out that whilst in home mines the accuracy of reports can be readily ascertained, such verification is impracticable as to a mine in California, Colorado, Nevada, Utah, or elsewhere at such a distance, the capitalist thus being at the mercy of agents and reporters of whom he may know nothing, and be unable to learn what they are or what they are about. There are reports on selected dividend mines and selected progressive mines, and carefully-arranged share-lists of recommended investments, as well as a list of investments in which trustees and executors are permitted to place funds which may be under their control. The circular is altogether well prepared.

FOREIGN MINING AND METALLURGY.

The work of reconstructing the commercial treaties between the various continental powers progresses but slowly. A Berne correspondent observes that, according to an official announcement, the Franco-Swiss Treaty, formal notice for the termination of which was given by France on June 30, 1874, will remain in force until August 10, 1877, in consequence of an agreement arrived at by the Governments. The treaty between Austria and Switzerland, which was also denounced in due form, has been provisionally extended for an indefinite period. The Swiss treaty with Italy was designed to terminate in May, 1877, but 12 months' notice is required for its termination, and this has not yet been given. Nothing decisive will be done in any case before next year. Much of the strength of the Protectionist party on the Continent is derived from the existing depression of trade. These delays are, therefore, advantageous to free traders, on whose side time may be said to be.

The improvement reported in the French iron trade does not amount to much at present; but, nevertheless, it exists, and some descriptions of iron are selling more easily than they did a month since. Luxembourg pig has also maintained its price of late. At Paris the state of affairs is sensibly better, at any rate as regards merchants' iron and girders. This is attributed to a resumption of building operations. The Nord and the Meurthe-et-Moselle do not appear, however, to have at present felt the effects of the improvement which has been reported at Paris. Rails remain in little demand upon the French markets, and plates for construction purposes are not much sought after in consequence of the check experienced in the prosecution of large public works. Considerable reliance is placed just now in Belgium upon Government orders for iron for railway purposes, and serious hopes are based upon some experiments which have been undertaken with a view to the introduction of iron sleepers. In the Meurthe-et-Moselle, in France, some expectations are also based upon analogous experiments undertaken by the Eastern of France Railway Company, but it is not in three or in six months that the French iron trade can begin to experience the good effects of such experiments.

Chilian copper in bars has made 77*l.* per ton at Paris, with delivery at Havre; ordinary descriptions ditto, with similar delivery, have brought 75*l.* per ton; ingots ditto, with similar delivery, 78*l.* per ton; English tough cake, with similar delivery, 77*l.* per ton; and pure Corocoro minerals, with similar delivery, 75*l.* per ton. At Rotterdam, Drontheim has brought 50 to 52 fls., and Russian Crown, 51 fls. The deliveries of Banca tin in Holland for the first eight months of this year are computed at 81,874 blocks, as compared with 94 104 blocks in the corresponding period of 1875, and 94,334 blocks in the corresponding period of 1874. The stock of Banca on schedules in Holland on Aug. 31, 1876, was 24,781 blocks, as compated with 12,300 blocks on Aug. 31, 1875, and 10,676 blocks on Aug. 31, 1874. The unsold stock of the Dutch Society of Commerce on Aug. 31, 1876, was 59,364 blocks, as compared with 81,748 blocks on Aug. 31, 1875, and 145,635 blocks on Aug. 31, 1874. Banca tin, delivered at Havre or Paris, has made 78*l.* per ton; Straits ditto, 78*l.* per ton; and English, delivered at Havre or Rouen, 78*l.* per ton. At Rotterdam, Banca has been quoted at 43 fls., and Billiton at 42¼ fls. French lead, delivered at Paris, has made 21*l.* 12*s.*; and English and Spanish, delivered at Havre, 21*l.* 12*s.* per ton. At Rotterman, Stollberg has made 13¼ fls. Silesian zinc, delivered at Havre, has made 24*l.* per ton at Paris. At Marseilles the quotation for rolled Vieille-Montagne zinc in sheets has been 30*l.* 16*s.* per ton.

The South German Group of Iron and Steel Associations has just held a meeting in Munich. The assembly declared itself to be opposed, from "political, economical, and financial considerations," to the transfer of the German railways to the Empire. The passing of a uniform patent law for the Empire was also declared to be an urgent necessity.

From statistics it appears that the production of pig-iron in the official Dortmund (Westphalia) district during the first half of the current year shows a decrease of 17 per cent. against the corresponding part of last year. The out-turn of cast-iron goods shows a decrease of about 43 per cent., and of wrought-iron a decrease of about 7 per cent. On the other hand, the production of steel shows an increase of 11 per cent. This increase has been chiefly turned out of the great works of Messrs. Krupp.

The weather in Belgium has experienced a great change, an almost wintry cold and abundant rains having succeeded a temperature too high to be agreeable. This change has produced some effect upon the Belgian coal trade, consumers having at last exhibited a disposition to lay in winter supplies. During the last few days deliveries have accordingly become more active, and the canals have exhibited more annimation. It is expected, under these circumstances, that the stocks of coal which have been formed of late in some of the Belgian coal-producing districts will shortly disappear, and this is the more likely to be the case since there does not appear to be anywhere any intention to increase the extraction. Prices remain about stationary upon the Belgian coal markets, the slight increase of activity which is observable not having been sufficient to secure any advance in quotations at present. It is proposed to extend the quay accommodation at Antwerp for the shipment of coal; three steam cranes for transferring coal from trucks are also in contemplation.

In France bad weather has recalled the fact that the season is now rather far advanced, and that consumers must lay in supplies of coal for the winter. Large orders are not likely under these circumstances to be delayed, and already there is a considerable increase in the demand. Prices, however, have experienced little change at present; and in the Nord as well as the Pas-de-Calais the new season commences with prices at a very low point. Purchasers show little disposition to consent to any sudden advance in coal rates. As regards the Paris market considerable reliance is placed on English competition, a competition which is likely to be encouraged by projects which have been matured for deepening the Seine. Consumers do not appear to be at all pressed; they are tolerably sure of being well and promptly served, and they accordingly exhibit a disposition to maintain their advantageous position with much firmness. The coal season does not open badly, however, upon the whole, for coalowners. Recent rains have done much good to beetroot, and have improved the prospects of the French sugar manufacturing interest, which is an important consumer of coal. The general state of affairs is also not bad.

It is generally believed that the autumn will bring with it an increase of work to the Belgian rolling mills and construction establishments; but it is difficult to ascertain upon what ground this hope or belief reposes. Small orders arrive and enable the works to keep their staff employed, but prices remain very low, and leave only a comparatively small profit. At an adjudication of rails for Brazil, which took place recently in England, a Belgian firm competed unsuccessfully, although its offer was lower than the rate at which the contract was secured by an English firm—5*l.* 8*s.* per ton. The administration of the Baden State lines is about to let a contract at Carlsruhe for 33,900 tons of Bessemer steel rails. A contract is also about to be let at Dresden for eight locomotive tenders for the State lines. The last number of the Bulletin of the Committee of French forgemasters contains an interesting paper by M. Ackerman, professor at the Stockholm School of Mines, "On the Present State of Metallurgical Industry in Sweden."

AN OPPORTUNITY FOR INVENTORS.—An interesting competition is about to be opened by the German Society Verein von Gas and Wasser Fachmannern Deutschlands, which offers a prize of $400 to the author of the process for the economical purification from carbonic acid of illuminating gas obtained from coal. The systems now commonly employed involve either hydrate of lime, certain salts—muriate of manganese for example, and iron oxides. Whether these methods leave more or less to be desired according to the nature of the coal distilled, or whether the forms of purifiers are imperfect, it is nevertheless certain that carbonic acid still remains present in illuminating gas, and its presence is decidedly unhealthy. Either a new system for its complete removal or an effective improvement on the older processes is required. The invention must be economical, easy of manipulation and must not lower the illuminating power of the gas. The memoir describing it must be complete, and explain both the theory and the practice. Manuscripts must be signed with some distinctive device, which is to correspond with a similar mark on a sealed packet in which is written the name and address of the author. Communications to be addressed to the president of the commission, Dr. Schilling, at Munich, prior to Dec. 31, 1876.

BLAKE'S PATENT STEAM PUMP.

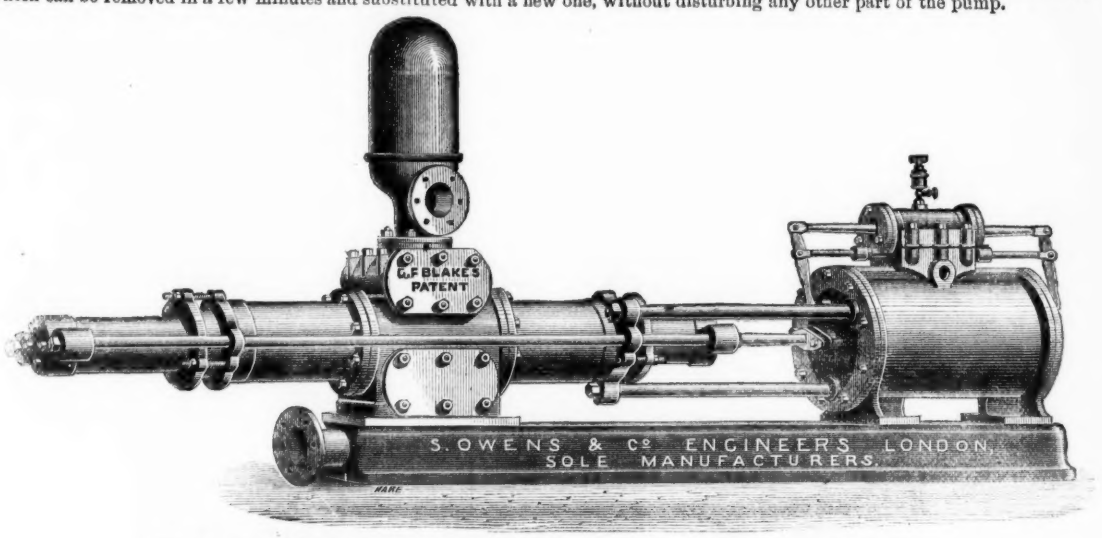
MORE THAN 8000 IN USE.

SOLE MAKERS FOR GREAT BRITAIN,

S. OWENS & CO.,

Hydraulic and General Engineers, Whitefriars-street, London; And at 195, Buchanan-street, Glasgow (W. HUME, AGENT).

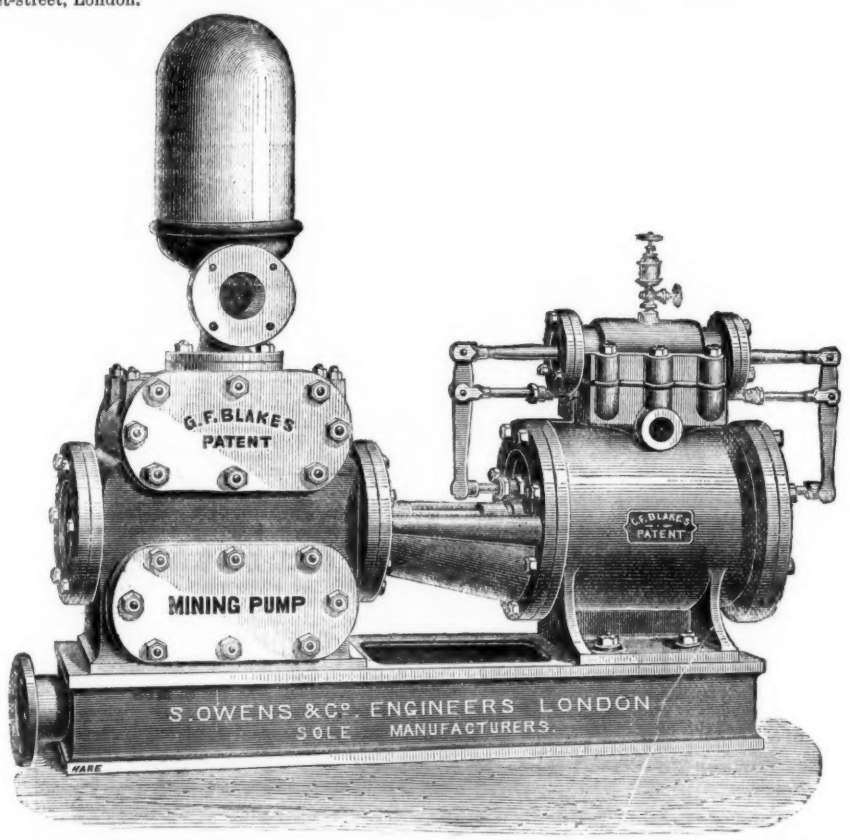
These PUMPS from their SIMPLICITY, RELIABILITY, DURABILITY, and ECONOMY are SPECIALLY SUITED FOR MINING PURPOSES, where large quantities of water require to be raised from great or medium depths with CERTAINTY. They are double-action in their construction, throwing a constant stream of water, can be made of any stroke to suit the space in which they have to work, can be arranged with any combination of steam and water cylinders to suit the pressure and lift against which it is desired to work them, are made of the very best materials and highest class of workmanship, and all working parts can be readily got at by any ordinary workman, and replaced if necessary by a duplicate part (all such being interchangeable) in the shortest possible time. For situations where gritty and sandy water has to be pumped the DOUBLE-PLUNGER PATTERN is recommended. Where space is limited the PISTON PUMP is better suited, a novel feature of which is the PATENT REMOVEABLE LINING, which can be removed in a few minutes and substituted with a new one, without disturbing any other part of the pump.



Blake's Improved Double-plunger Steam Pump.

S. OWENS AND CO.,

In placing the BLAKE STEAM PUMP before the mining world, believe they are offering the BEST, MOST RELIABLE, and ECONOMICAL PUMP that has yet been made, and solicit an inspection of various sizes in operation at their works, Whitefriars-street, Fleet-street, London.



Blake's Improved Mining Pump, with Patent Removeable Lining to Pump Cylinder,

Any combination of these Pumps may be had to suit circumstances. The following are some of the SIZES SUITABLE FOR MINING PURPOSES:—

Dia. of steam cylinders.. In.	12	12	12	12	14	14	14	16	16	16	16	18	18	18	18	20	20	20	20	24	24
Dia. of water cylinders.. In.	3	4	5	6	4	5	6	4	5	6	8	4	5	6	8	5	7	8	9	6	8
Length of stroke ..... In.	18	18	18	24	24	24	24	24	24	24	24	24	30	30	30	30	30	36	36	36	42
No. of strokes per minute..	30	30	30	30	25	25	25	22	22	22	22	22	22	22	22	20	20	17	17	17	15
Quantity in gallons per hour, approxmately ...	1440	2610	4200	5940	2940	4620	6600	2646	4158	5940	10620	2646	5160	7500	13260	4586	9000	12360	15660	6720	20

PRICES FOR THE ABOVE, OR ANY SPECIAL SIZE, AND ILLUSTRATED CATALOGUES FURNISHED ON APPLICATIO

PATENT CONDENSORS

Can be supplied for any size pump to effect a saving of fully 30 per cent. in the consumption of fuel, greatly increasing their efficiency

The Blake Pump will work under water, and as efficiently with compressed air as with steam.

BLAKE'S DONKEY PUMPS FOR FEEDING BOILERS KEPT IN STOCK.

PARIS EXHIBITION, 1867.

VIENNA EXHIBITION, 1873.

LONDON EXHIBITION, 1874.

CORNWALL POLYTECHNIC SOCIETY, 1867 and 1873.

TANGYE BROTHERS AND HOLMAN,

10, LAURENCE POUNTNEY LANE, LONDON, E.C.,

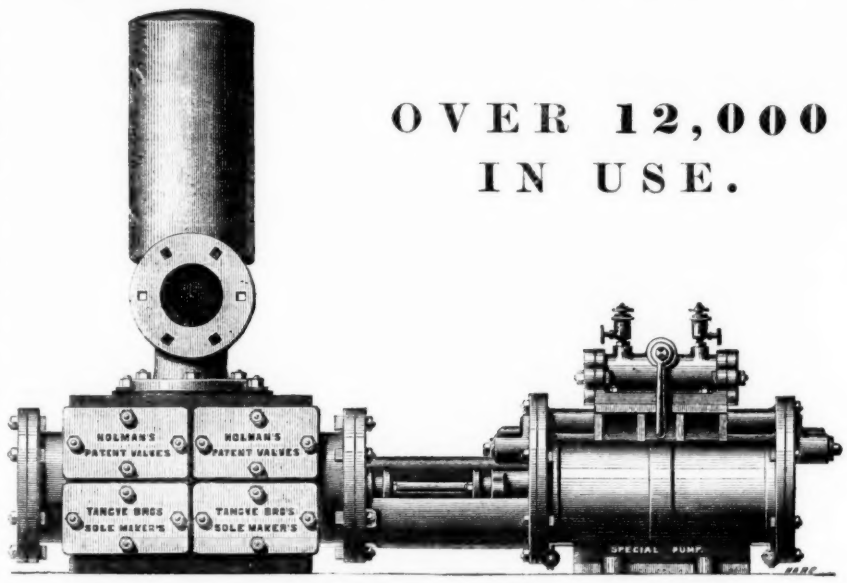
AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO

FOR

"THE SPECIAL"

DIRECT-ACTING STEAM PUMP.

After eight years of successful application for all purposes to which steam-driven pumps can be applied, THE "SPECIAL" STEAM PUMP STILL MAINTAINS THE FIRST POSITION IN THE MARKET, notwithstanding that it alone—of all direct-acting pumps—has been subjected to the great variety of severe tests that must be encountered in such a period of time. Some valuable improvements have been suggested in the course of a long experience, and their adoption has rendered the apparatus at once the simplest and most certain in action. There is absolutely no extraneous gear, and the steam cylinder is *no longer than the pump*. The valves are of easy access, and are suited for pumping fluids and semi-fluids of almost any consistency.



OVER 12,000 IN USE.

WILLIAM ELLIOT, Esq., *of the Weardale Iron and Coal Company, writes under date Sept. 17th, 1875, as follows:*—"We have now THIRTY-FIVE of your SPECIAL STEAM PUMPS in operation at the various collieries under my charge—some of them employed pumping water out of our pits to the depth of 50 fms.—others employed in the pits, and a good many feeding Boilers. I have no hesitation in saying that we have found them the Cheapest and Best Pumps of the kind we have tried. I can with confidence recommend them to intending purchasers.

Messrs. BURT, BOULTON, and HAYWOOD, *Chemical Manufacturers, of London*, have also THIRTY-EIGHT of the "SPECIAL" STEAM PUMPS in use at their works, and continue to order more.

GREAT REDUCTION IN PRICES.

The following sizes are suitable for low and medium lifts:—

Diameter of Steam Cylinder ...In.	3	4	4	4	5	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10
Diameter of Water Cylinder ...In.	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	9	5	6
Length of Stroke .....In.	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	12	18	24	12	12
Gallons per hour	680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070	7330	9750	13,000	5070	7330	9750	13,000	16,519	5070	7330
Price .....£	**16**	**18**	**20**	**25**	**22 10**	**27 10**	**32 10**	**25**	**30**	**35**	**40**	**30**	**35**	**40**	**45**	**50**	**40**	**45**	**50**	**55**	**65**	**50**	**55**	**60**	**70**	**85**	**55**	**60**

CONTINUED.

Diameter of Steam Cylinder..In.	10	10	10	10	12	12	12	12	12	12	14	14	14	14	14	14	16	16	16	16	16	18	18	18	18			
Diameter of Water Cylinder..In	7	8	9	10	6	7	8	9	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14			
Length of Stroke .....In.	12	18	24	24	18	18	18	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24			
Gallons per hour	9750	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000			
Price .....£	**55**	**75**	**90**	**100**	**75**	**80**	**85**	**110**	**120**	**140**	**110**	**120**	**130**	**140**	**160**	**180**	**140**	**150**	**160**	**180**	**200**	**180**	**190**	**210**	**220**			

Intending purchasers of Steam Pumps would do well to observe the great length of stroke, short steam cylinder, and short piston of the "Special" Steam Pump, as compared with the short stroke, long steam cylinder, and long piston of the Pumps of other makers, as the efficiency and durability of the machine, and the space occupied by same, greatly depend upon this. The advantage of long strokes will be obvious when purchasers are reminded that each set of suction and delivery valves of a "Special" Steam Pump with 24 in. stroke, running at 120 ft. per minute, would open and close only 30 times per minute, as against 120 times per minute in a Pump with only 6 in. stroke performing same duty.

The Special" Steam Pump can be worked by Compressed Air as well as by Steam.

HUNDREDS of these PUMPS are USED for HIGH LIFTS IN MINES, for which purpose they are made with 21, 24, 26, 28, 30, and 32-inch Steam Cylinders, and 36 48 and 72-inch Strokes.

Holman's Patent Self-acting Exhaust Steam Condensers,

FOR ALL KINDS OF STEAM PUMPS AND HIGH-PRESSURE STEAM ENGINES.

TURNS WASTE STEAM INTO GREAT POWER.

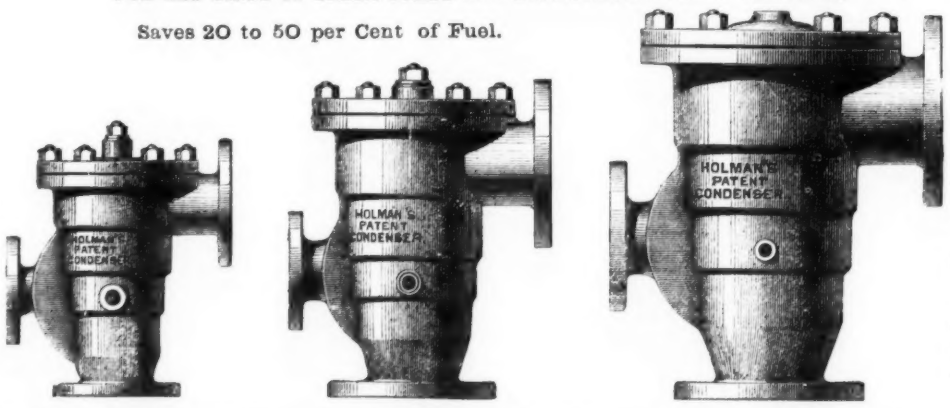
REQUIRES NO THREE-WAY COCKS, CHECK, or REGULATING VALVES.

SAVES HALF ITS COST IN PIPES AND CONNECTIONS.

PREVENTS ALL ESCAPE OF STEAM IN MINES OR ELSEWHERE.

REQUIRES NO EXTRA SPACE.

Saves 20 to 50 per Cent of Fuel.



These Condensers are made to suit any size and kind of Steam Pump. They form a part of the suction pipe of the Pump, and while they effectually condense the exhaust steam they produce an average vacuum of 10 lbs. per square inch on the steam piston, increasing the duty of the Engine, and effecting a saving in fuel of from 20 to 50 per cent.

In Mining operations these Condensers will be of great value.

All Boiler Feeders are recommended to be fitted with these Condensers, as not only is the exhaust steam utilised in heating the feed water, but is returned with it into the boiler.

The following Testimonial gives one Example of the Power Gained by the action of Holman's Patent Condensers:—

MORLEY COLLIERY, WIGAN, October 16th, 1874.

Messrs. TANGYE BROTHERS AND HOLMAN.

GENTLEMEN,—I have great pleasure in recording my entire satisfaction with the working of the Holman's Patent Steam Pump Condenser which you have supplied to us. The complete condensation of the steam is, apart from its value in the strict economical sense, a most valuable feature in the drainage of underground workings. The perfect manner in which this important result is accomplished by your Condenser is extremely creditable to you, and merits the thanks and commendation of the Mining Engineer. When we start the "Special" Steam Pump the Condenser commences working automatically, and maintains a constant vacuum of 10¾ lbs. per square inch, even when we run the Pump upwards of 80 strokes (106 feet) per minute. It may perhaps be interesting to you to know that when we were running the Pump at 84 strokes (168 feet) per minute, the steam gauge indicating a steam pressure of 36 lbs. per square inch, 80 yards from the Pump, and the Condenser vacuum gauge on the exhaust pipe indicating a steady vacuum of 21½ inches, I turned the exhaust steam from the Condenser into the atmosphere, when the speed at once fell to 44 strokes per minute. The waste economy thus shown is really so great that the cost of the Condenser must be saved in a very short time. (Signed) J. THOMPSON.

Price from 30s. to 40s. per inch diameter of Steam Cylinder, according to the relative Diameter of Pump for which Condenser is required.

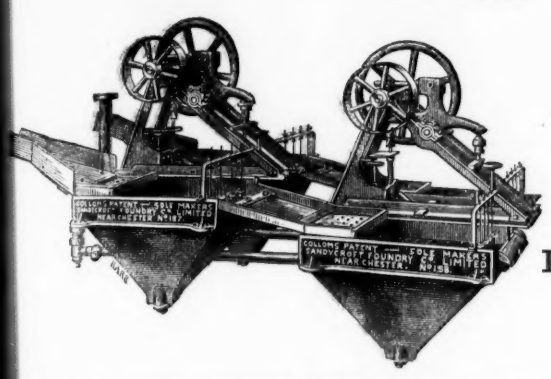
NORTH OF ENGLAND HOUSE ... ... TANGYE BROTHERS AND RAKE, ST. NICHOLAS BUILDINGS, NEWCASTLE-ON-TYNE.
SOUTH WALES HOUSE... ... ... TANGYE BROTHERS AND STERL, Tredegar Place, NEWPORT, Mon.; and Oxford Buildings, SWANSEA.

PATENT IMPROVED ORE WASHING & DRESSING MACHINES.

THE SANDYCROFT FOUNDRY & ENGINE WORKS CO. (LIMITED), NEAR CHESTER

LATE THE MOLD FOUNDRY CO. (ESTABLISHED 1838).

SOLE MAKERS IN GREAT BRITAIN.



HUNDREDS IN USE.

FULL PARTICULARS,
PHOTOGRAPHS, TESTIMONIALS, AND PRICES,
UPON APPLICATION.

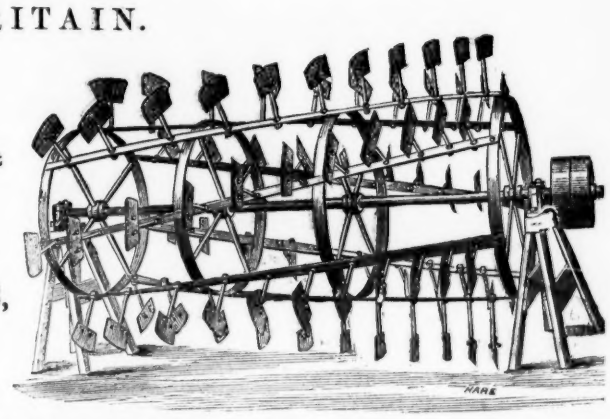
Will supply Designs, and all the necessary Plant for laying out Dressing Floors; also

MANUFACTURERS OF EVERY VARIETY OF

MINING MACHINERY.

PUMPING & WINDING ENGINES,

PITWORK, CRUSHING MILLS,
ROLLS
OF PECULIARLY HARD AND TOUGH MIXTURE
&c., &c.



COLLOM'S PATENT AUTOMATIC ORE WASHING MACHINE, working at the following and many other Lead, Copper, Blende, and Tin Mines:—Great Laxey, Cape Copper, Pontgibaud, Linares, Alamillos, West Tolgus, Lisburne, Minera Halvans, Snailbeach, &c.; and also at Messrs. Vivian and Sons' Works, Swansea.

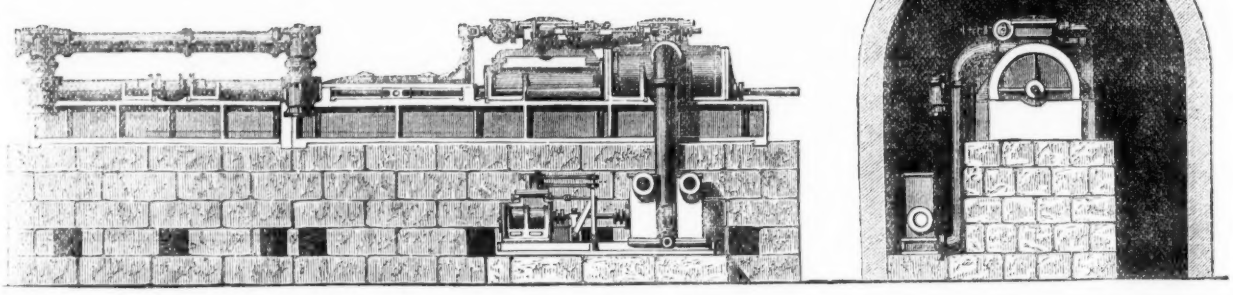
PATENT IMPELLER, OR KNIFE BUDDLE, in use at the following and many other Lead, Copper, Blende, and Tin Mines:—The Van, Roman Gravels, Tankerville, Ladywell, Lisburne, East Black Craig, Old Treburgett, Penhale & Barton, Bog, Linares, Fortuna, Alamillos, Minera Halvans, &c.

LONDON OFFICE: 6, QUEEN STREET PLACE, E.C.

HATHORN, DAVIS, CAMPBELL, AND DAVEY,

MAKERS OF

The Differential Pumping Engine, Hydraulic Pumping Engines, Cornish Engines, Differential Blowing Engines, Compound Rotative Engines, the Separate Condenser, Hydraulic Machinery, Mining Plant of all kinds, and Machinery for Water Supply, Irrigation, &c.

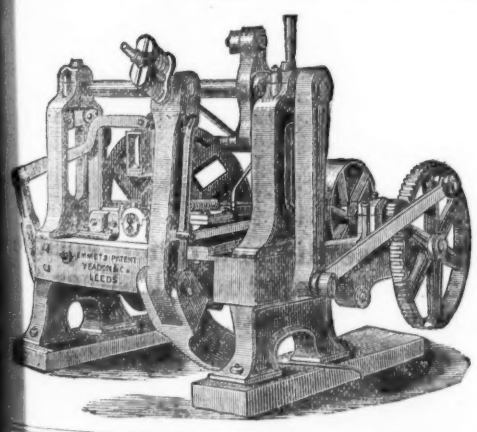


THE COMPOUND DIFFERENTIAL ENGINE AND FORCE PUMPS,

With Separate Condenser, as applied Underground, forcing 700 gallons per minute 920 feet high.

SUN FOUNDRY, LEEDS.

FURTHER PARTICULARS ON APPLICATION



EMMET'S

A1 PATENT BRICK MACHINE.

Massive; durable; cheap; takes little power, and gives PERFECT SATISFACTION.

This is the ONLY Machine which presses the Brick equally on BOTH sides, each plunger entering the mould plate $\frac{3}{8}$ in., and turning out 12,000 SQUARE, SOLID, PRESSED Bricks per day, READY AT ONCE FOR THE KILN.

SOLE MAKERS--

YEADON AND CO.,

CROWN POINT FOUNDRY, LEEDS.

Makers of EVERY DESCRIPTION of Colliery and Brick Yard Plant.

LONDON AGENTS—
HAUGHTON AND CO., No. 122, CANNON STREET, E.C.
CONTINENTAL AGENTS—
PLAMBECK AND DARKIN, 171, QUEEN VICTORIA ST., E.C.

ARTESIAN BORINGS

for WATER SUPPLY to TOWNS, LAND IRRIGATION, and MINERAL EXPLORATIONS, may be executed of any diameter, from 6 in. to 36 in., and to any depth to 2000 ft.,

istons & Air-pump Buckets fitted with Patent Elastic Metallic Packing

of which upwards of 8684 have been made to March, 1875.

MATHER AND PLATT,

MAKERS OF LARGE PUMPS AND PUMPING ENGINES.

Improved Valves and Taps for Water, Steam, Gas, &c.

PATENT STEAM EARTH-BORING MACHINE

ENGINEERS and MACHINE MAKERS to CALICO PRINTERS, BLEACHERS, DYERS, and FINISHERS.

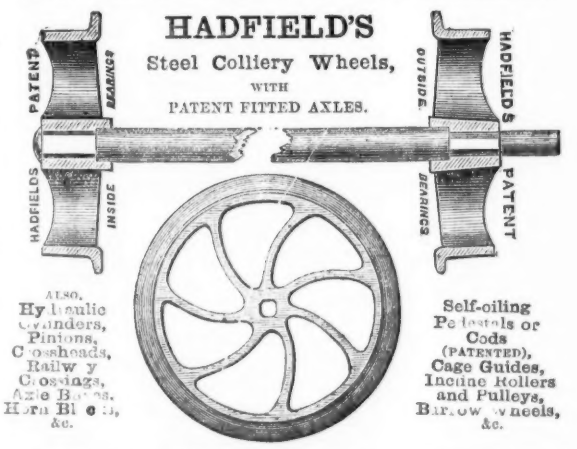
SALFORD IRONWORKS, MANCHESTER.

PRICES AND PARTICULARS ON APPLICATION.

TO COLLIERY PROPRIETORS, MINING ENGINEERS, &c.

HADFIELD'S

Steel Colliery Wheels,
WITH
PATENT FITTED AXLES.



ALSO,
Hydraulic Cylinders, Pinions, Crossheads, Railway Crossings, Axle Boxes, Horn Blocks, &c.

Self-oiling Pedestals or Cods (PATENTED), Cage Guides, Incline Rollers and Pulleys, Barrow Wheels, &c.

Hadfield's Steel Foundry Company,

MANUFACTURERS OF EVERY DESCRIPTION OF

CRUCIBLE CAST STEEL CASTINGS.

ATTERCLIFFE, SHEFFIELD.

THE NEWCASTLE DAILY CHRONICLE
(ESTABLISHED 1764.)
THE DAILY CHRONICLE AND NORTHERN COUNTIES ADVERTISER
Offices, Westgate-road, Newcastle-upon-Tyne; 50, Howard street North Shields; 195 High-street, Sunderland.

Just published, Free Edition.

GUIDE TO HEALTH; or, ADVICE AND INSTRUCTIONS FOR THE CURE OF NERVOUS DEBILITY.—A New Medical Work on the Treatment of Local Debility, Consumption, Loss of Memory, Physical Depression, Indigestion, and all diseases resulting from loss of nerve power. Illustrated with cases and testimonials. Sent free for two stamps.—Dr. SMITH will, for the benefit of country patients, on receiving a description of their case, send a confidential letter of advice.
Address, Dr. H. SMITH, 8, Burton-crescent London, W.C.

BUYERS are CAUTIONED against Purchasing any Infringements of H.R.M.'s Numerous PATENTS.

Ore Crushers, H.R.M.'s New Patent Crushing Jaw EXTENSIVELY USED BY MINE OWNERS.

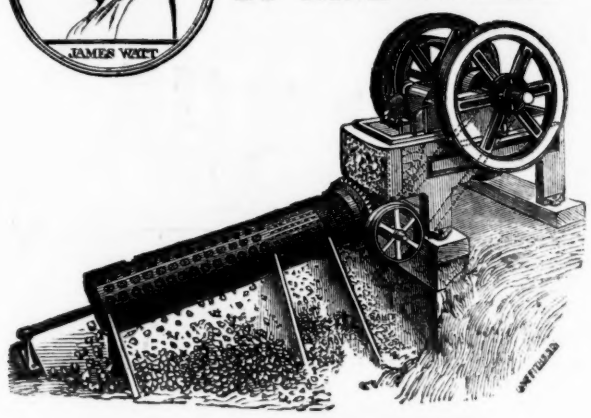
H.R. MARSDEN, LEEDS,

ENGINEER.

Mining Improvements

Revolving Picking Table.

1150 NOW IN USE.



FIXED MACHINE AND SCREEN,

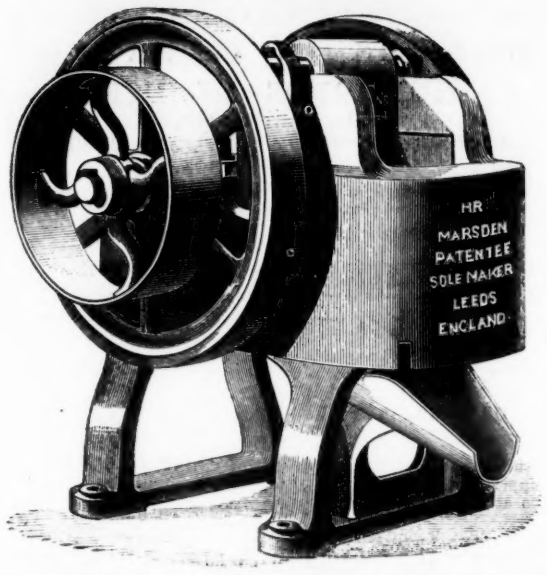
Specially designed and largely used for

Crushing Pyrites, Limestone, Cement, Coal, Rocks, &c.,

AT ALL THE PRINCIPAL WORKS IN THE KINGDOM.

Takes in 20 in. by 9 in., and is shown by TESTIMONIALS to be breaking from 1000 to 1200 tons per day of 10 hours, at THREE HALF-PENCE PER TON.

FEW WORKING PARTS.
SMALL WEAR AND TEAR.
FREEDOM FROM BREAKAGE.



"The Machine is well designed, simple, but substantially made and is capable of reducing any material to fine gravel, such as copper ore, and is certainly preferable to the stamps in use for that purpose."—*Mining Journal.*

MACHINE FOR HAND OR STEAM POWER.

For making gravel for gentlemen's walks in parks and gardens, also for grinding emery, flints, fossils, &c., for pulverising silver, copper, and other ores; also gold quartz, and especially useful to chemists and metallurgists for sampling, as it is capable of pulverising the hardest material, and can be turned by one man with ease.

REFERENCES TO ALL PARTS OF THE WORLD.

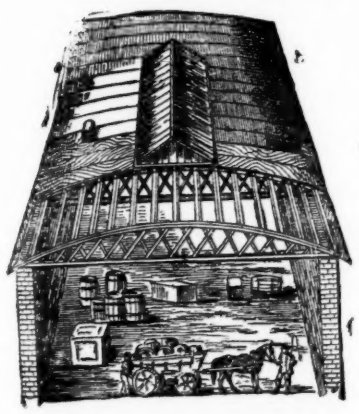
SIMPLICITY OF CONSTRUCTION. EXCELLENCE OF SAMPLE. ECONOMY OF POWER

THESE STONE BREAKERS AND ORE CRUSHERS ARE UNIVERSALLY PRONOUNCED THE ONLY PERFECT SUCCESS.

For Catalogues, Tetimonials, &c., apply to the—

Sole Maker & Patentee, H. R. MARSDEN, SOHO FOUNDRY, LEEDS, ENGLAND.

M'TEAR AND CO.'S CIRCULAR FELT ROOFING,



FOR GREAT ECONOMY AND CLEAR WIDE SPACE.

For particulars, estimates, and plans, address,—

M'TEAR & CO.,
ST. BENET CHAMBERS,
FENCHURCH STREET,
LONDON, E.C.;
4, PORTLAND STREET,
MANCHESTER;
OR
CORPORATION STREET,
BELFAST.

The above drawing shows the construction of this cheap and handsome roof, now much used for covering factories, stores, sheds farm buildings, &c., the principal of which are double bow and string girders of best pine timber, sheeted with ¼ in. boards, supported on the girders by purlins running longitudinally, the whole being covered with patent waterproof roofing felt. These roofs so combine lightness with strength that they can be constructed up to 100 ft. span without centre supports, thus not only affording a clear wide space, but effecting a great saving both in the cost of roof and uprights.

They can be made with or without top-lights, ventilators, &c. Felt roofs of any description executed in accordance with plans. Prices for plain roofs from 30s. to 60s. per square, according to span, size, and situation.

Manufacturers of PATENT FELTED SHEATHING, for covering ships' bottoms under copper or zinc.

DRY HAIR FELT, for deadening sound and for covering steam pipes, thereby saving 25 per cent. in fuel by preventing the radiation of heat.

PATENT ASPHALTE ROOFING FELT, price 1d. per square foot.

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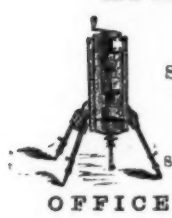

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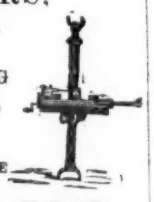

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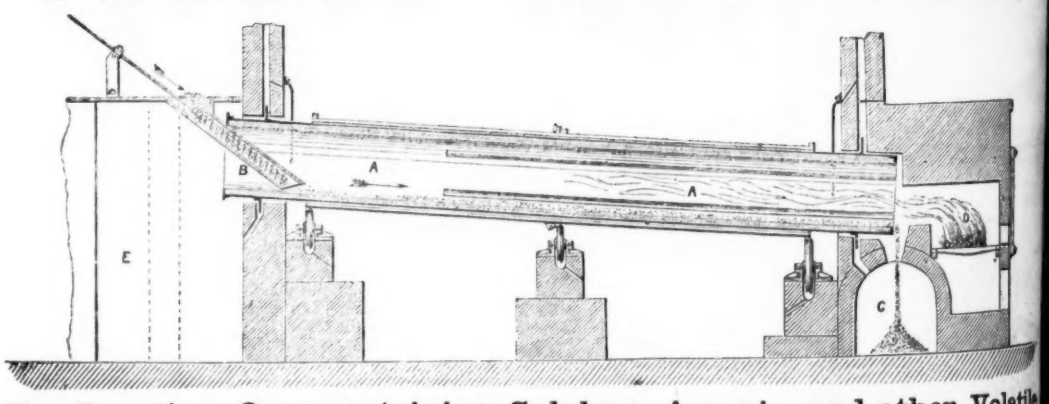

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